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TERMINOLOGY PROBLEMS IN THE INTERPRETER'S WORK IN THE SPHERE OF DIGITAL ART

TERMINOLOĢIJAS PROBLĒMAS TULKA DARBĀ DIGITĀLĀS MĀKSLAS JOMĀ

MASTER THESIS

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ANOTĀCIJA

Pētnieciskā darba mērķis ir apkopot un analizēt digitālās mākslas terminus, lai uzzinātu kādas terminoloģijas problēmas ir sastopamas latviešu digitālās mākslas terminoloģijā un kā tās ietekmē tulka darbu. Mutiskajā tulkošanā termini tiek skatīti, kā saziņas un funkcionālas vienības. Teorētiskajā daļā ir iekļauta autora veidotā pētījuma metode. Termini ir atlasīti no tehniskajiem blogiem, kurus ir publicējis datorprogrammatūru izstrādes uzņēmums *Autodesk.* Tika izvēlēti 19 blogu ieraksti, kas bija publicēti laika posmā no 2017. g. 20. februāra līdz 2017. g. 20 aprīlim. Tika atlasīti un analizēti 109 termini, kuri ir iekļauti terminu sarakstā. Pētījuma rezultāti liecina, ka problēmas digitālās mākslas terminoloģijā galvenokārt izraisa paralēlismi, aizguvumi un nepietiekama standartizācijas prakse.

Atslēgvārdi: mutiskā tulkošana, terminoloģija, digitālā māksla, terminoloģijas problēmas, saziņa, standartizācija.

ABSTRACT

The present research aims to collect and analyse digital art terms in order to find out what terminology problems are present in the Latvian digital art terminology and how do they affect the work of an interpreter. Terms in the context of interpreting are seen as communicative and functional units. The theoretical part of the paper includes the author's research methodology. Terms are selected from the technical blogs published by the software company *Autodesk.* 19 technical blog articles, published from February 20, 2017 to April 20, 2017, were analysed and 109 terms were selected and enclosed in the glossary. The findings reveal that problems in the digital art terminology are mainly caused by parallelisms, borrowings and insufficient standardization practices.

Keywords: interpreting, terminology, digital art, terminology problems, communication, standardization.

Contents

INTRODUCTION

The development of terminology is intrinsically linked with the development of the scientific and technical sphere the term system is connected to. New concepts, scientific discoveries and technology appear daily, which are then recorded, and new terms appear denoting them. Each language has its own approach and system of developing terminology; it is based on the history of research and the influence that terminology schools and movements have brought to the language region.

The first building blocks of Latvian terminology were laid in the 16th century with the printing of religious and legal texts (Baltiņš, 2013: 419). It continued to develop under the rule of different political powers and reached the level of standardization that exists now. The turning point in this development was the creation of the Terminology Commission of the Academy of Sciences of Latvia on September 9, 1919, which made sure that the process of terminology is based on collective, planned and institutionalized work (Baltiņš, 2013: 425-426). The advancement of greater accessibility of terms came with the creation of the Translation and Terminology Centre in 1996. The work done at the centre led to the creation of the first free access terminology database in Latvia, which was set up in 1999 and is now the Terminology database of the State Language Centre (Baltiņš, 2013: 431).

The standardization of terminology and the creation of free access terminology databases improve the work of translators and interpreters, who work as mediators transferring information from the source language into the target language. The way interpreters apply terminology differs for that of translators (Zauberga, 2016). The timeframe in which both professionals work is different and the preparation is different. The interpreting process can be viewed as consisting of stages and the stage in which interpreters analyse language and terminology is the preparation phase (Veisbergs, 2009). The collection of terminology is very important when interpreting scientific and technical discourse. In this context, the terms need to be viewed as functional and communicative units.

When preparing the terminology for an interpreting assignment the interpreter is faced with several terminology problems, such as the existence parallel variants in both source and target languages, the use of calques, borrowings, transfer of abbreviations and the reliability of sources that contain term equivalents. If the field is very narrow, then the term equivalent in the target language may not be accessible and the interpreter either creates an occasionalism or explains the

concept. For interpreters, the context is the most important factor. The output must be comprehensible, logical and it has to maintain the sense of the source text or speech.

The **goal of the research** is to collect and analyse digital art terms in the technical blogs published by the software company *Autodesk,* in order to find out what terminology problems are present in the Latvian digital art terminology, which affect the work of an interpreter.

The **enabling objectives** are the following:

1. To read and analyse secondary sources on terminology and interpreting;
2. To collect technical blog articles published by *Autodesk* from February 20, 2017 to April 20, 2017 and select the terms the articles contain;
3. To create a methodology based on the research of Ieva Zauberga (2016), Jānis Sīlis (2009), Andrejs Veisbergs (2009; 'Interpreting and the Latvian Language: Linguistic Aspects', vvk.lv), and Jennifer Pearson (1998);
4. To analyse the collected terms in the context of interpreting to find out what terminology problems exist in digital art terminology.
5. To make concluding remarks on the terminology problems revealed in the digital art terminology and their effect on the interpreting process.

The **research questions** focus on whether there are terminology problems in the Latvian digital art terminology, what are the terminology problems that exist in the field, how do they affect the work of an interpreter.

The present research consists of two parts – theoretical and empirical. The theoretical part provides an overview of the history and development of terminology and interpreting, the problems existing in Latvian terminology and the theories and approaches to terminology and interpreting. The empirical part analyses the terminology problems present in the collection of digital art terms. The **research methods** are the following: the library research, internet research and the author's methodology based on the research of Ieva Zauberga (2016), Jānis Sīlis (2009), Andrejs Veisbergs (2009; 'Interpreting and the Latvian Language: Linguistic Aspects', vvk.lv), and Jennifer Pearson (1998).

The **empirical analysis** is created on the basis of 19 technical blog articles published by the *Autodesk* software company, which include 109 terms that are enclosed in a glossary. The terminology problems present in the glossary are analysed.

The **first chapter** presents the secondary sources about the development of terminology, schools of terminology, history of Latvian terminology, computer terminology and terminology problems.

The **second chapter** includes the secondary sources on the history of interpreting, interpreting studies, the preparation phase of the interpreting process, terminology in the context of interpreting, the interpreted text and the way terminology affects the output quality.

The **third chapter** is devoted to the terminology of the research, which is based on the research of Ieva Zauberga (2016), Jānis Sīlis (2009), Andrejs Veisbergs (2009; 'Interpreting and the Latvian Language: Linguistic Aspects', vvk.lv), and Jennifer Pearson (1998).

The **fourth chapter** presents the results and analysis of the terminology problems in the digital art terminology.

1. TERMINOLOGY THEORY AND TERMINOLOGY PROBLEMS

Chapter I provides a comprehensive look on the history and the development of terminology as well as the problems that appear in the field. It is important to understand the development of terminology as it reveals different approaches and problems, which lays the groundwork for analysing the interpreter's work in a specific terminology field, i.e. digital art. The chapter encloses subchapters on the schools of terminology, the terminology in Latvia, the pragmatic and functional approaches of terminology, the theory and practice aspects of terminology, the computer and digital art terminology as well as the problems of terminology.

1.1. Terminology

The concept of terminology can be viewed from various angles. According to Maria Teresa Cabré (1999), "the word terminology refers to at least three different concepts:

a. The principles and conceptual bases that govern the study of terms,

b. The guidelines used in terminographic work,

c. The set of terms of a particular special subject" (Cabré, 1999: 32).

However, Latvian researchers Juris Borzovs, Ilze Ilziņa, Valentīna Skujiņa and Ilze Vancāne (2001) distinguish two concepts of terminology:

1. *Terminology* as a science that researches the naming of concepts and is aimed at collecting terms and dividing them according to fields and subfields;
2. *Terminology* as a collection of terms that reflects the concept system of a field (2001: 83).

Both typologies have similar elements, such as the concept of terminology as a collection of terms, and differences concerning the classification of terminographic work. All of these concepts regarding terminology are valid in the context of the present research. The principles of terminology science need to be looked at because of their effect on the system of terms that belong to a particular field. And the terminographic work is a part of an interpreter's work, i.e. compiling glossaries on specific subject fields. When casting a broader look at the above-mentioned typologies both are based on the modern understanding of terminology, which can trace its roots to the mid-20th c.

Terminological processes have a long history, but as Cabré (1999) points out, only in the recent decades terminology has been 'systematically developed, with full consideration of its principles,

bases and methodology*'* and adds that 'terminology, as we understand it today, first began to take shape in the 1930s and has only recently moved from amateurism to a truly scientific approach' (1999: 1). It is important to note that the development of terminology studies was affected by the changing social, political and technological landscape of the time. The same factors also influenced the field of conference interpreting at that time.

In order to understand the significance of terminology, the approaches to viewing it and its place in the context of interpreting we must look in which category of terminology does interpreting fit.

There can be identified three approaches to terminology:

1. A first approach that considers terminology to be an interdisciplinary but autonomous subject at the service of scientific and technical disciplines;

2. A second approach focusing on philosophy, which is primarily interested in the logical classification of concept systems and the organization of knowledge;

3. *A third approach focusing on linguistics, which considers terminology a subcomponent of a language's lexicon and special languages as subsystems of general language* (Cabré, 1999: 6).

The first approach is the most applicable in the context of translation and interpretation as it concentrates on compiling and structuring terms. This approach views terminology as an applied science and is a more pragmatic and functional approach to this field. Terminology is a process that can aid communication and understanding, and, therefore, is an innate part of interpreting.

The above-mentioned approaches to viewing terminology have developed during the past century and it is crucial to see how it affected terminology, especially in Latvia.

1.1.1. The development of terminology

The history of terminology can be traced back to the 18th century research into the natural sciences. This research continued to affect the field of terminology in the following century, which arrived with an increased internationalization of science; consequently, the need for a set of rules on how to formulate terms was expressed by scientists at the international natural sciences meetings (Cabré; 1999: 1). The scientists who were dominating the field of terminology in the 18th and the 19th centuries were joined by engineers and technicians in the 20th century (ibid: 2). This was a time when technologies were advancing rapidly in an increasingly globalized world. This change led to new agreements of terminology use, and the Terminology Schools of Vienna and the Soviet

School of terminology were born (ibid: 2). The modern terminology emerged with the creation of the Vienna School of Terminology.

The development of modern terminology has been identified into four periods by Auger (1988):

1. *the origins (1930-1960)*
2. *the structuring of the field (1960-1975)*
3. *the boom (1975-1985)*
4. *the expansion (1985-present)* (Auger, 1988, cited in Cabré, 1999: 5).

The first period is characterized by creating the methodology of how to systematize and standardize terminology. Linguists and social scientists started to get involved into the field of terminology only from the 1950s (Cabré; 1999: 2). Before that scientists were the ones that dominated the field, e.g. E. Wüster (1898-1977), who had an education in electrical engineering and after working in the field became interested in terminology and its standardization. This period was dominated by the views of Wüster and his ideals of how the terminology should be structured. He was first concerned with the practice-orientated methodology of standardization, and only later with the theory of terminology (ibid: 7). The theoretical aspects were discussed during the second period of development.

The second period came with the advances of computer technology, which changed the way terms were documented and analysed. Databanks were first created and used to store terms, which contributed greatly to the process of terminology standardization (ibid: 6). International organizations such as the UN were involved in creating an international standard and spreading the ideas created in the first period of modern terminology development.

The third period was marked by language planning, which some countries (USSR, Israel) started already during the second period, and the availability of personal computers that revolutionized the way terminological data was stores and analysed (ibid: 6). During the third period the computer technology continues to play a significant role in the development of terminology. Information is more widely available and more easily exchanged.

Due to the current development, the approach to terminology has changed. Cabré (1999) explains that the current approach to terminology is based on a descriptive approach to language as opposed to a prescriptive approach that dominated the early periods of terminological development. Thus, the change has been based on the views of the society as well as the field of science.

The different approaches can be best shown by viewing the changing approaches affected by the schools of terminology.

1.1.2. Schools of terminology

The modern system of terminology studies is based on the work created by the three schools of terminology: the Vienna, the Prague and the Soviet School (Temmerman, 2000: 2).

The Austrian researcher E. Wüster, founder of modern terminology and the Vienna School of terminology, advocated for a clearer and unambiguous professional communication at an international level. His most significant work was The *Machine Tool. An interlingual Dictionary of Basic Concepts* (1968), which was a dictionary in eight languages that enclosed standardized terms and sponsored by the Organisation for Economic Cooperation and Development (OECD) of the United Nations. His work remains to be immensely influential. Wüster continued his cooperation with the UN; with the support from UNESCO, he created and lead the 'international centre for the collection, dissemination and coordination of information about terminology' (Temmerman, 2007: 28). This centre later became *Infoterm*, the International Information Centre for Terminology, to which the Terminology Commission of the Academy of Sciences of Latvia is a member. The main purpose of the Vienna school was to standardize terminology and numerous countries in Europe (Austria, Germany, Norway, Sweden, and Denmark) work based on these ideas, according to which specialists are *responsible for specialized terminologies* (Cabré, 1999: 13). The general theory of terminology is based on the principles set by the Vienna school of terminology.

The Czech School of terminology, also known as the Prague school of terminology was focused on the 'structural and functional description of special languages' (ibid). A special language is a style of language that includes subject-specific terminology, syntax and expressions or as Cabré puts it, a 'professional style' (ibid). Therefore, the Czech school concentrated on the special languages that include terminology as opposed to the concept system created by Wüster. However, the third school of terminology – the Soviet School – was influenced by the ideas of Wüster, so at the centre of research at the Soviet school was not *the special language* but *the concept.* The aim was to standardize terms and concepts due to the multilingualism of the former Soviet Union (ibid).

These three schools were centres from which ideas on terminology spread to the Western Europe, Scandinavia, and later to the South (Spain, Portugal, Norther Africa, sub-Saharan Africa,

Central and South America), and more recently to the East (Japan, China) (Cabré, 1999: 12). The development of terminology in a language depends upon the approaches to terminology that existed and were accepted, therefore, national terminology systems must be viewed in this context.

1.1.3. History of Latvian terminology

The 20th century saw Latvia going through great changes in political structures and spent half a century under the rule of the Soviet Union. In the 20th century these social and political changes affected the Latvian terminology development, which had begun centuries before.

According to the analysis of Latvian terminology led by a team of researchers at the Translation and Terminology Centre (TTC) in Latvia (2005), the groundwork for creating a Latvian terminology was first laid in the 16th and 17th c. with the printing of religious and legal texts (TTC, 2005: 7). The end of 18th c. saw the terminological development of medical and agriculture terms, whereas a target-oriented approach to terminology only appeared starting from the National Awakening movement at the end of the 19th c. (TTC, 2005: 7). The oldest terminological dictionary in Latvia was compiled in 1822, when the manuscript dictionary 'The Collection of Latvian Medical Words' ('Latviešu medicīnas vārdu vākums') was compiled (Skujiņa, 2005). The most efficient process of standardization and the development of Latvian terminology began with the creation of an independent Latvian state in 1918.

The first Terminology Commission was created in 1919 and numerous sections were established, including the sections on the arts, the technologies and mathematics (TTC, 2005: 8). During the soviet period the system of terminology changed and due to the Russian language becoming the administrative language, the Latvian terminology system was not as strong as it became after Latvia regained its independence. At the beginning of the soviet period, in 1946 the Terminology Commission of the Latvian Academy of Sciences was established and it continued the traditions created in the previous decades while being under political pressure, i.e. the commission was criticized for its purist approach and not respecting the Russian language (Pūtele, 2016: 110). The terminological system in Latvia is rooted in the Soviet school of terminology that was based on the ideas of the general theory of terminology and aimed at dealing with a terminology in a multilingual state. This approach to terminology is affected not only by history but also linguistic factors.

The terminology studies during the past century have developed from applying a mostly prescriptive approach advocated by Wüster to a more descriptive approach. Nevertheless, each

terminological approach may differ. So does the Latvian approach, which has its roots in the prescriptivist-dominated general language theory. This is due to the fact that the Latvian language receives more terms than creates them. This is particularly true in the field of computer terminology, which is dominated by English borrowings. According to the researcher and interpreter Ieva Zauberga (2016), the societies who create terms may afford using the descriptive approach to see how the language is developing; however, those societies that are at the receiving end are more prone to the prescriptive approach of standardizing and controlling the language in order to safeguard its linguistic structure (2016: 67). Therefore, the reason for applying a more prescriptive approach in Latvia is based on the status of the language as well as its history of terminology development.

The history of terminological development tells a story of changing perceptions and language influences. The terms have changed form, their meaning and several other aspects. Skujiņa (2005) has listed some of the linguistic factors that have affected change in terminology:

- Over time preference is given to the shorter term,
- The adjectival element's passive voice present participle is replaced by the genitive form of a deverbalized noun with an ending -šana (e.g. *pievelkamais spēks – pievilkšanas spēks)*,
- Adjectives have switched between the endings -īgs and -isks,
- The borrowing has been replaced by a Latvian variant,
- Two words assimilated into a compound (2005: 129).

Skujiņa (2005) states that these factors exist also today in managing the existing terminology fields and in developing new ones. However, the trends in term creation and development may change depending on the main contact language. The current situation in Latvian terminology sees the influence of English, from which not only specialised terms are borrowed but also general language words, which is a new development in Latvian terminology (Pūtele, 2016: 112).

1.2. Terms

According to Skujiņa (2002), a term is a functional unit, which means that it is not a special lexical unit but a word with a special function (Skujiņa, 2002: 7). Skujiņa argues against the concept that a term is not a word. She also opposes the idea that a term stands apart from the entire lexical language system, which is based on the *absolute term theory***.** According to this theory, a term is similar to a sign (unlexicalized language unit) due to the term and the sign having similar

characteristics: emotionally expressive neutrality, it can be replaced with a sign and it has no lexical meaning (ibid).

Skujiņa states that within a field of application the lexical unit acquires its terminological nature (ibid). Scientific and technical languages are included in the terminology fields of application. According to Skujiņa, as terminology has developed into a scientific field, researchers generally refer to terms as scientific terms. She also states that the *functional meaning* is very important and it consists of two parts: the nominative and the definitive. The *nominative meaning* means that the term nominates or describes some concept or object. And the *definitive meaning* signifies the fact that the term must be definable, i.e. have a definition (ibid: 8).

The characteristics of terms have also been researched by Cabré (1999), who distinguishes the differences between words and terms to define what terms are. In one of these binary oppositions she uses the factor of pragmatics as a tool to distinguish them; Cabré writes that the type of discourse, topic, setting and text are specific, professional and subject-orientated (1999: 36). The terms are 'used to talk about specialized topics' and 'usually appear in technical and scientific discourse' (ibid).

On the level of grammar, terms can be nouns, adjectives, verbs or adverbs, but among all other grammatical categories nouns represent 'two thirds of all terms' (ibid: 112). So subject fields are dominated by nouns. Borzovs et al. (2001) also state that usually terms are part of the noun category. The researchers also describe terms as consisting of either one lexeme or more than one lexeme, i.e. compound.

The best way to understand the nature of terms is in a binary opposition. Therefore, Borzovs et al. (2001) have created a table to clearly define the difference between general language words and terms.

Word	**Term**
Names a real object	Expresses the definition of a real object
Does not usually refer to a specific field	Has a specific meaning in a particular field
Is found in the regular bilingual dictionaries	Is found in term dictionaries of a specific field
Develops gradually	Is introduced quickly
Meaning can change in different contexts	Meaning is fixed in any context
Emotionally nuanced or situationally conditional	Is not emotionally coloured, is not situationally conditional
Synonyms are preferred	Synonyms are not preferred

Any grammatical category	Usually a noun

Table 1.1 The differences between words and terms. Borzovs et al. (2001: 83) (translated by A.Tirzīte).

The table shows the preferred characteristics of terms, e.g. lack of synonymy, which in practice may not be a general rule. When terms are applied into a field such as interpreting, the pragmatic approach adds additional layers of understanding terms as part of the interpreting process.

1.2.1. Terms and pragmatics

Terms among being grammatical and functional units are also 'pragmatic units of communication and reference' due to which terms have discourse characteristics (Cabré, 1999: 112). When viewing terminology from a pragmatic standpoint the difference between terminology and general language appears clearly.

GENERAL LANGUAGE LEXICON	TERMINOLOGY
BASIC PURPOSE	BASIC PURPOSE
performative, expressive, communicative, and others	referential
SUBJECTS	SUBJECTS
generic	specific
USERS	USERS
general	specialists
COMMUNICATIVE SITUATION	COMMUNICATIVE SITUATION
– structured	+ structured
DISCOURSE	DISCOURSE
general	professional and scientific

Table 1.2, The differences between the general language lexicon and terminology (Cabré, 1999: 113).

This differentiation is at the basis of understanding terminology in the context of interpreting as it addresses the discourse, communicative situation, users, subjects and purpose. In theory, the terms are unambiguous, used in structured communicative situations by experts. But in everyday situations these clear-cut lines are softer. As Cabré states, 'In reality, experts in a given domain can

use the specialized terminology in a variety of communicative acts and at several different levels of abstraction, thus blurring the classic, well-defined view of what terminology is' (1999: 114).

Within a pragmatic frame the interpreter's use of terminology can be analysed as it is situation-orientated and user-orientated approach. The situation where the interpreter has to deal with scientific discourse when interpreting specific subjects the role of terminology becomes larger. Terms become the basic units of understanding and communication between the speaker and the listener. Thus, in an intermediary setting the interpreter uses the terminology for communicative purposes.

Cabré (1999) distinguishes two dimensions of terminology: communicative dimension and a linguistic dimension. The linguistic dimension encloses the work by linguists and language planners for whom terminology is the target of their work (Cabré, 1999: 11). However, the subject field specialists and users of terms as communicative units are part of the communicative dimension (ibid). According to Cabré (1999) 'terminology is a set of useful communicative units which must be evaluated from the point of view of economy, precision and suitability of expression' (ibid: 33). Interpreters fall into the category of people using terminology to facilitate communication for other people. The communicative factor is very important in order to create a clear message. The intermediary, i.e. interpreter, uses terms in a communicative situation, and the end goal is that people understand each other. In this case context takes up a larger role.

The pragmatic and functional theories show the importance of terms in contexts, thus showing the need for communication mediators to concentrate on both terms and the wider context. Each interpreting assignment is on a specific topic and therefore a specific set of terminological units are used. The terminology domains, e.g. medicine, architecture, computer terminology, have their own characteristic aspects and each have developed differently.

1.3. Computer terminology

In the middle of the 20th c. the most notable contribution to theoretical and applied terminology was made by scientists and technicians, which Cabré explains as being a natural process: "Subject matter and methodology develop when there is a need, and are pursued to the extent that they are the result of clear social needs." (Cabré; 1999: 2). The technology development has brought a real necessity to create an adequate terminological system.

The technologies that appear always pull terminology with it, but it is rarely at the same speed that terms for new concepts appear in translations. According to Jammal (1988), researcher of

scientific discourse, observes that ‘science flies and its terminology walks -typically at a pace that lags far behind scientific advances’ (Jammal, 1988, quoted in Fleischman, 2001: 473). While in some regions the technology develops and new concepts are created, in others these concepts need to be introduced into languages and translated. Thus, terminology is affected by extralingual factors. One of these is the country where new developments or concepts have been created. For instance, the US is the birthplace of much of the technology used in digital art. Therefore, the terms are then taken from the source language, i.e. English. These English language borrowings are intrinsically linked with the field and concepts they denote. However, not all of these term equivalents in Latvian are equally successful and comply with the stylistic conventions and norms (Zauberga, 2016 :31). It is possible to eradicate these problems by developing the field they are part of.

Borzovs et al. (2001) state that the development of terminology is most needed in the fields that are currently experiencing development, such as IT (2001: 83). The Information Technology (IT) sphere has appeared relatively recently, but the demand for it in nearly every field including art has grown very fast. In Latvia, the first terms on computing appeared in the field of physics, the earliest recordings are found in a textbook on physics published at the end of the 19th c. (Borzovs et al., 2001: 83). The development continued throughout the 20th century but focused and systematic work on IT terminology started with the creation of the Terminology Commission of the Latvian Academy of Sciences (TC of LAS) IT subcommittee founded in 1993 (ibid). At this time in history the wish to develop Latvian language including its terminology was strong and the field of terminology saw a great upsurge. Numerous dictionaries on computer terminology were published.

New computer terms are appearing almost every day. This puts a strain on finding equivalents that comply with the Latvian language standards. Nevertheless, term equivalents need to be created as a result of a collaboration between linguists and field specialists. And this process should not be spontaneous, but measured and well-grounded; work led by a team of specialists (Borzovs et al., 2001: 84). And even when term equivalents are created, the original term may go out of style and be replaced by another, which is the case with the term ‘digital art’.

1.3.1. The term ‘digital art’

According to the Oxford English Dictionary (the OED) the concept digital art is ‘Art created or modified using a computer or other digital medium’ (digital art, 2017). However, several decades before a different term was used to denote this concept.

The term ‘digital art’ is a recent replacement of the term ‘computer art’ that was created in 1963 to describe the new blend of art and computer technology. As the researcher Grant T. Taylor (2014) describes, the term ‘digital art’ started predominating the field due to the negative connotations the previous term (computer art) was associated (2014: 2). Art critics and journaists used the term ‘computer art’ as a pejorative term branding it as bad art (ibid). While the term ‘computer art’ is still sometimes used in academia and remains in the names of a few centres, forums and societies, e.g. The Computer Art Forum, the consensus from art critics, curators and theorists now use ‘digital art’.

The reasoning behind the change from the word ‘computer’ to ‘digital’ is because the developments in the field of technologies have made the descriptive word ‘computer’ outdated (2014: 2). The artworks that are created in this field are made using laptops, smartphones, and other devices, which are part of tools that are used. These tools are part of ‘an array of integrated portable digital technologies that link their social and working life’ (Taylor, 2014: 1). The characteristic element of this variety of devices is that they are digital devices and the artworks are digital. Thus, the term ‘digital art’ would be a more precise term due to it describing the art creations. Also, the term ‘digital art’ started to overcome the previous term in the 1990s, the time when new changes were introduced to computer technologies (ibid).

Technologies at that time became more user-friendly and artists could finally use the opportunities computers provided. The perception towards digital art quickly changed after the successful implementation of 3D technologies in creating motion pictures. The digital art using the newest software and hardware technologies changed the perception of computer-mediated art. The change in terminology reveals the change in artistic practice. When the term ‘computer art’ first appeared the ‘artwork’ could be created by technicians or artists with the help from technicians. The software gradually developed and became more user-friendly and artists, architects and musicians were able to use it without much additional help. The intuitiveness of the new software programs enabled greater freedom for expression. His broadening of application also led to the broader platforms where art can be displayed, consequently, the term ‘computer’ became restrictive.

Thus, when talking about digital art and the work done by digital artists, the tools that create digital art are found in the sphere of software. The platforms have also developed from computer screens to the 3D virtual reality glasses. The rapid change in technology has created new tools of creating art, new mediums and platforms to view them on and new concepts that denote all this spectrum of creating, viewing and interacting with digital art.

The equivalents of the term 'digital art' in Latvian show the history of the technology. Equivalents offered by online dictionaries include the terms: *cipariskā māksla, datormāksla* and *digital art*. The last equivalent, which is the closest one, is marked in the dictionary as unadvisable and favouring the term *datormāksla* (literally, computer art). This example shows how the terminology reflects the time and that the terminology needs to be updated. These numerous term equivalents pose a problem for interpreters.

1.4. Terminology problems

While the computer technology has advanced the science of terminology, term collection and standardization, it has also been the root cause of terminology problems. These problems that interpreters face every day are the number of parallel terms, the number of term translations that have unreliable sources and other factors that affect the work of an interpreter or a translator.

The type of problems that are the most pressing for interpreters belong to the semantic aspect (polysemy, synonymy, homonymy), the functional aspect, and the term creation aspect as interpreters are occasionally faced with the task of creating neologisms for terms that have no available equivalent in the target language. But before delving deeper into the classification of problems, it is crucial to describe the aims of term creation.

1.4.1. Aims of term creation

The Latvian linguist Inta Freimane (1993) distinguishes the aims of term creation:

- Semantic precision,
- Unambiguity,
- Short, euphonic and easily pronounceable terms,
- Stylistic and emotional neutrality (Freimane, 1993).

The same principles appear in other works on terminology (Cabre, 1999). Terms are functional elements and the first aim (semantic precision) is crucial. Also, the unambiguous nature of terms is important because terms aid communication by providing precise and concise descriptions of

real world objects. If they are not semantically precise or ambiguous then terms lose their function. The first two aims are about the denotational value of terms and these are the levels that interpreters look at and analyse in the preparation phase before interpreting. The last two aims mentioned by Freimane (1993) highlight the fact that terms need to be understandable, concise and easily pronounceable; these factors are significant for interpreters in their work as they are dealing with spoken language. Alongside the above-mentioned list Freimane (1993) shows the following aspects that need to be addressed when creating terms:

1. Terms in the context of general and literary language,
2. The scientific precision of terms,
3. The problem of parallelisms in terminology,
4. Term compliance with the language's functional demands,
5. Terms in the context of other functional variants and styles of a literary language,
6. Borrowings in terminology.

All of these aspects address a variety of problems facing the field of terminology, which will be outlined in the following subchapters.

1.4.2. Term creation

Linguists have identified several ways terms can be created. They can be created by linguists and terminologists or people who use terminology, such as field specialists, translators and interpreters. Countries create systems on how to appropriately introduce terms in the language system. Some terms can be advised to be used in some domains and they must comply with the language system they are introduced in. Several terms are not introduced officially, but used only in a closed professional domain, i.e. professionalisms, and often they create problems in the process of interpreting.

Freimane states that internationalisms are favourable in terminology because they are emotionally neutral, they do not create semantic and etymological associations, they can be derived more easily and are usually shorter and more concise than the national lexis (Freimane, 1993). These terms are established in the field and understood internationally. Another way to create terms is to use international elements (e.g. makro-, anti-) to create terms, which are not pure internationalisms but a variant (Freimane, 1993).

When referring to the problematic term creation factors, Freimane (1993) states that calques are the biggest problems of language practice. According to the OED, a calque, also called a loan

translation, is ‘an expression adopted by one language from another in a more or less literally translated form’ (calque, 2017). Freimane (1993) believes that these calques do not comply with the norms and standards of the Latvian language but they introduce foreign aspects into the target language, which may sound strange and stand out in the text. However, several researchers state that these calques are not altogether a negative thing because language has developed through calques and borrowings. According to Zauberga (2016), are a type of translation practice. One example of these literally translated terms, i.e. calques, is the Latvian term *mākoņpakalpojums*, which is directly translated from English term *cloudservice*. While calques are literally translated words, borrowings are directly taken terms, e.g. *interactivity* (EN) – *interaktivitāte* (LV). Freimane (1993) also calls these borrowings as calques, while Veisbergs (‘Pūrisms un latviešu valoda’, vvk.lv) and Zauberga (2016) state that these are borrowings. The conceptual basis of borrowings and calques are more precisely described by Zauberga (2016) and Veisbergs (‘Pūrisms un latviešu valoda’, vvk.lv).

These borrowings and calques are a negative trend in Latvian terminology because sometimes suitable Latvian equivalents exist and additional borrowings add unnecessary parallel structures. These parallel structures are classified as part of the semantic aspects.

1.4.3. The semantic aspect

Theoretically terms are unambiguous and one terms refers to one object, i.e. mono-referential (Cabré, 1999: 107-108). In general language, words often are polysemous, i.e. a word has more than one definition; however, in terminology unambiguity and correspondence to one concept is a key principle, which does not very often occur in practice (ibid). While in lexicography polysemy means that one term describes numerous concepts (bi-referential), in terminology a bi-referential term is homonymy (Cabré, 1999). Homonymy appears frequently in terminology as ‘any term from a special field that is extracted by analogy and applied to another field will be a homonym’ (ibid: 111). This constitutes as homonymy because each special field is a separate domain.

However, if one concept is designated by numerous terms, then these terms are synonymous. In the field of terminology synonyms are ‘semantically equivalent units that belong to the same historical language and to the same formal register’ (Cabré, 1999: 110). In general language polysemy enriches the language with new words and is mostly seen as a positive element. But in terminology the key factor is unambiguity and clarity; consequently, the synonymous units are a problem that must be eliminated by reducing the synonymous forms.

Synonymy and homonymy in the field of terminology are classified as parallelisms. Parallel forms appear often due to the presence of calques, which exist as parallel forms of Latvian terms and internationalisms (Butāne, 2016: 39). According to Freimane (1993), these parallel structures are the most important problems in the field of terminology, because of their polysemous nature. Freimane lists the following reasons that cause the creation of parallelisms:

1. new, active borrowings appear alongside the existing national language terms,
2. one of the synonyms are used metonymically,
3. the realia has several names depending on the sphere of application (Averbuhs, 1986, cited in Freimane, 1993).

The first cause is especially relevant in the context of the present research. The technology develops and the concepts become popular and the need to translate relevant texts is greater then before. This leads to numerous term variants which are synonymous and create problems for the interpreter, who needs to decide which of them to use in the interpreting assignment.

1.4.4. The functional aspect

Interpreters use terms in the spoken language and in this context, it is necessary to look at terms in the context of functional linguistics. Terms are functional units and the functional approach demands the terms to be short, easily pronounced and euphonic (Freimane, 1993). The functional aspects are important when analysing the way terms are used in practice. The economy of words and their usage is an important aspect. Often interpreter does not know a term and in these cases the interpreter often chooses the much more economic approach, e.g. he does not explain the concept but creates a borrowing (Veisbergs, 'Interpreting and the Latvian Language: Linguistic Aspects', vvk.lv). The interpreter chooses to provide a meaningful output and may economise of time spent pronouncing a very long term or definition.

To sum up, the present chapter provides an overview of the history and development of modern terminology by analysing the works of Maria Teresa Cabré (1999) and Rita Temmerman (2000), who showed the advancement of terminology in Europe as well as the approaches applied in the terminology field. These advancements were applied in the Latvian terminology and affected the way terminology was built in professional domains, such as computer terminology. The historical, linguistic and social background was portrayed to show the context in which terminology problems appear in Latvian and other languages. The terminology problems were analysed based on the work

by the linguist Inta Freimane (1993) who described the different types and causes of problems in the field of terminology and the work of Ieva Zauberga (2016).

The following chapter is on the role terminology plays in the field of interpreting.

2. INTERPRETING AND TERMINOLOGY

The current chapter provides a comprehensive look on the role terminology plays in an interpreter's work. Terms are the basic units of technical and scientific communication, which interpreters need to mediate. Therefore, to understand terminology in the context of interpreting, the chapter encloses an overview on the history and types of interpreting, the stages of the interpreting process, the role that terminology plays in this process, the output quality of an interpreter, the terminology sources used by interpreters as well as the difference approaches interpreters and translators apply when using terminology.

2.1. History of interpreting

Interpreting is one of the oldest professions. As long as there has been the need to communicate with foreign language speakers there has existed interpreting (Veisbergs, 2009: 10). There are numerous types of interpreting and the oldest of them is liaison interpreting, also called community interpreting or dialogue interpreting. Liaison interpreting is a consecutive interpreting variant used in such settings as schools, the police or a business meeting, during which the interpreter takes up an active role as a cultural mediator (ibid: 78). Other types of interpreting include simultaneous interpreting, sight interpreting, sign interpreting and chuchotage, i.e. whispered interpreting.

The 20th century saw changes in the development of the field of interpreting with the introduction of conference interpreting. Before then French was the diplomatic language, which dominated in the international communication, thus, interpreters were not needed (Veisbergs, 2009: 11). According to Ebru Diriker (2013) the 1919 Paris Peace Conference was 'a landmark for conference interpreting between spoken languages' during which two languages – English and French – became the working languages (2013: 363). A team of interpreters had been assembled for the conference, which they interpreted consecutively into their native languages (Veisbergs, 2009: 11). The same practice continued after the peace talks and the use of French and English interpreting was adopted in conferences for the League of Nations (Veisbergs, 2009: 12). A new landmark in the development of conference interpreting was the Nuremberg war crimes trials, which included interpreting into four languages (German, French, Russian, English) and introduced the concept of simultaneous interpreting that we know today (Diriker, 2013: 364). Experiments using simultaneous interpreting appeared before that time but after the trials it became

more widespread and the United Nations adopted the practice of providing interpretation into Chinese, French, Russian, English, Spanish and later Arab (Veisbergs, 2009: 12). Now due to technological advancement conferences can offer translations in even more languages. The European Union language policy offers every delegate to speak his native language because interpreting in the EU institutions is provided into all 24 EU languages.

2.2. Interpreting studies

With the development of interpreting research on the field, the practical aspects and processes were created. According to Franz Pöchhacker (2013) the first promoters of the research on interpreting were psychologists and educators (2013: 60). One of the most notable researcher of interpreting studies is Danica Seleskovitch, who's work on the *théorie du sens* (the 'interpretive theory') laid the groundwork for the Paris School of interpreting and the further development of the field.

The interpreter and scholar Danica Seleskovitch, the founder of the Paris School of interpreting created the theory called *théorie du sens*, which drew focus on the deverbalization stage of interpreting (Diriker, 2013: 368). Seleskovitch (1977) stated that

> *Interpretation is not a direct conversion of the linguistic meaning of the source language to the target language, but a conversion from source language to sense, the intermediate link being nonverbal thought, which, once consciously grasped, can then be expressed in any language regardless of the words used in the original language* (Seleskovitch, 1977: 28, cited in Diriker, 2013: 368).

Seleskovitch states that the deverbalization phase is crucial in the interpreting process. Her focus on the context and not lexical equivalence of every word promoted numerous other research with the idea that an interpretation can be more economical, i.e. shorter, without losing its semantic value or the 'sens' (Diriker, 2013: 369).

Since the creation of the *théorie du sens* the basic aspects of the interpreting process have not changed. The idea of deverbalization is still at the core of the interpreting theory. Context is crucial to understanding the topic discussed and when the speaker uses specific terminology the interpreter needs to know the context, the definition of the term, the concept it denotes and the equivalent in the target language. To make sure that the context is understood the interpreter has to prepare.

2.3. Preparation phase of the interpreting process

The researcher Sylvia Kalina (2010) describes interpreting as an activity that 'include processes before, during and after interpreting proper' adding that while all of these phases affect the output, not all can be fully controlled by the interpreter (2010: 80). Amongst the problems that arise for an interpreter is lack of time, lack of data on the discussed topic or lack of available terminology. Sometimes the organizers of a conference send materials on the topics to be discussed or already prepared speeches, but more often the information must be collected by the interpreter (Veisbergs, 2009: 32). The interpreter then collects materials and creates term glossaries on the subject of the assignment. Veisbergs stresses that the collection of information and terms allows the interpreter to have a more in-depth view of the subject and the collected materials can be of use in the following assignments (ibid).

The preparation phase is an important part of the interpreting process and the correct management and compilation of data means better output when interpreting (Costa, H., Pastor, G. C., & Munoz, I. D., 2014). In order get better results and save time interpreters can use such technical tools as Intergloss or InterpretBank; however, Costa, Pastor and Munoz (2014) admit that some interpreters still store information on pieces of paper and excel spreadsheets (2014: 28). And not always the terms which are needed can be found in the term banks. Consequently, interpreters are often faced with problem-solving tasks, which is especially common when dealing with specific texts with dense terminology. Kalina refers to the researcher Drechsel (2005), who has listed the tools that interpreters currently use during the preparation phase: search machines, scientific websites, company or customer websites, online libraries, e-publication services and online magazines (Drechsel, 2005, mentioned in Kalina, 2010: 80). Online resources and term banks have made the work before interpretation quicker and more efficient. Nevertheless, according to Kalina (2010) these technical tools are not always used or are not sufficiently developed.

Preparation before the assignment and familiarity with the topic being discussed is especially important in simultaneous interpreting as it leads to better anticipation (Setton and Hild, 2004). The notable interpreter and researcher Ghelly V. Chernov (2004), has extensively analysed the aspects of anticipation and interference in simultaneous interpreting and states that an interpreter in order to provide a successful interpretation must 'acquire the habit of independently preparing herself for a conference on any topic' (2004: 199). And even though this Chernov's research was originally published in 1987 and since then the methods of acquiring and collecting terms has changed, the basic principles has not changed. Terms with their context need to be prepared in

advance for a better output. According to Sylvia Kalina's research on interpretation quality the lack of conscientious preparation usually has 'a perceptible effect on the TT', i.e. the target text (2002: 128).

Some cases of interpreting and role of preparation is different and requires great participation in by the organizers of the interpreting assignment to aid preparation for interpreters and other participants in the event. The researcher Erik Hertog (2002) says that in some fields of interpreting, e.g. court interpreting, this preparation should involve lawyers, magistrates, and other professionals, as well as the interpreter must be respected by being given a status in the proceedings, enough time to prepare and the necessary terminology (2002: 156).

2.4. Terminology in the context of interpreting

For translators and interpreters, terminology usage is a significant part of their work. They intermediate communication between people of different languages and in order to interpret the ideas and concepts they need to know the terminology of a specific field discussed. The preparation time for interpreters is filled with research on the topic, people and concepts, and a large part of this process is learning and compiling the necessary terminology. 'Experts use terminology not only to order thought, but also to transfer specialized knowledge in one or more languages and to structure the information contained in specialized texts' (Cabré, 1999: 45). Therefore, for interpreters the knowledge on the terminology is key.

The researcher Cabré (1999) discusses translation-orientated terminology. It is a separate orientation, which is well-developed in countries and regions with more than one official language; the terminological work by the multilingual international bodies (UN, EU) are based on the translation-oriented process (ibid: 13). Thus, the political and economic systems contribute to the standardization of terminology, which helps to avoid problems with terminology such as parallel terms. These parallel forms need to be considered when compiling glossaries, the process of which is similar to the work of a terminographer.

Several researchers (Cabré, 1999; Sīlis, 2009) stress that terminography is not the same as translation. Interpreters and translators are not the developers of terminology but its users. Interpreting involves finding the best equivalents while the work of a terminologist is more in-depth. The work of a terminologist entails 'gathering the designations that users of a language use to refer to a concept and ultimately, if necessary, proposing alternatives in those cases where speakers' designations are unsatisfactory' (Cabré, 1999: 115). Sometimes the work of an interpreter

overlaps with that of a terminologist. Interpreters often face challenges when working with terms due to the nature of the preparation process which often is constrained of time. Cabré (1999) admits that interpreters occasionally 'have to act as terminologists to find equivalents for those terms that are not listed in the available vocabularies nor in specialized data banks' and the limited time to prepare does not allow interpreters to receive help from a terminologist (1999: 48). Sīlis distinguishes two separate approaches that translators and terminologists have when dealing with terminology. The translators view terms and concepts in their context, whereas terminologists "consciously isolate terms from their context" in order to define their place in a concept system (Sīlis, 2009: 105). While there are some similarities with terminology collection in the work of an interpreter and a translator, some basic principles are different.

2.4.1. An interpreter's approach to terminology

The researcher and interpreter Ieva Zauberga (2016) states that the main goal of an interpreter in to ensure effective and immediate communication (2016: 65). In order to achieve this goal the main criteria are: a pleasant voice, fluency, logically connected speech, the meaning of the input corresponds with the interpreter's output, interpretation being complete, correct use of grammar and terminology (Buhler, 1986, cited in Zauberga, 2016: 65). The correct use of terminology is very important in the interpreting process as it shows how trustworthy and professional is the interpreter; however, Zauberga (2016) adds that the correct use of terminology, while being very important to interpreters, is not as important as to translators (2016: 66). This is due to the fact that interpreters mainly need to rely on the context, for in the event of a conflict between the terminology used by experts and terminology provided by competent terminology institutions, interpreters usually trust the advice by the experts (ibid). This is because the experts are the ones that use the interpretation services (ibid). Interpreting is a service that offers professionals communicate with each other. Therefore, the interpreters need to use the terms their clients use.

To show the practice differences between translators and interpreters Zauberga (2016) distinguishes three interpreting-specific aspects of using terminology. First, interpreters learn new vocabulary by listening to the speakers; interpreters create glossaries before the assignment and add new term variants during or after the assignment (ibid). Consequently, interpreters have in-depth knowledge on the terms professionals use. And even if the professionals use imprecise or unaccepted terms, interpreters use these terms in the assignment to maintain consistency (ibid). Second, interpreters may choose not to use officially accepted terms (ibid). Zauberga explains that

clients usually do not like to be corrected on their usage of terms, i.e. that they are not using the correct or official term; therefore, according to the main principles of interpreting, interpreters use the terminology that the client uses (ibid: 66-67). Third, the terminology of an interpreter is not as stable and objectively set as to terminologists because some terms go in and out of fashion (ibid: 67). All of these aspects affect the use and compilation of glossaries. As terms and phases used by professionals are usually the ones that will need to be interpreted, professionalisms and other term variants need to be enclosed in the glossary.

The terminology use of an interpreter and translator is different. But professionals from both areas face similar problems with the terminology system in Latvia, which has been described by the Latvian translator and interpreter Jānis Sīlis (2009).

2.4.2. The situation in Latvia

In Latvia, there are several terminology-based problems that interpreters face in their work. Some are indirectly created by the nature of the interpreting profession and others are those that relate to the centralization and availability of the terminology system.

Jānis Sīlis (2009, 2012) has discussed the terminology problems facing interpreters and translators. He writes about the pressure for translators to become terminologists due to the short deadlines and the vast amount of new information there is to translate and interpret (Sīlis, 2009). Consequently, the interpreter has no time to approve the newly created terms according to the adoption process of the Latvian Terminology Commission of the Latvian Academy of Sciences (LZA Terminoloģijas Komisija) (Sīlis, 2009: 105). Therefore, new terms appear in the field, which may cause problems in the future with parallel variants.

According to Veisbergs, interpreters create parallel variants because of the solution they choose when faced with an unknown term or concept (‘Interpreting and the Latvian Language: Linguistic Aspects’, vvk.lv). There are situations when interpreters are faced with a term that has no equivalent in Latvian, a term that the interpreter does not know or has forgotten, or a term that the interpreter can understand but cannot render into Latvian (ibid). As mentioned previously, interpreters are focused on providing the meaning, not absolute equivalence; therefore, when the equivalent cannot be rendered, interpreters choose to create a borrowing or to explain the term (ibid). Afterwards, these occasionalisms (i.e. also, nonce words, are words or phrases created to be used only once) are picked up by the listeners and applied in future discourse. Jānis Sīlis (2009)

says that these occasionalisms may be left out of the terminology standardization process, but should not be ignored because of their potential use in the future (2009: 130).

Another issue is the availability of approved terminology. Numerous researchers from Latvia have stressed the importance of a centralised terminology system (Freimane, 1993; Dika, 2005, Sīlis, 2012). Ilze Dika addressed this issue when researching the translation of EU laws into Latvian. Dika concludes that there is a necessity for a national data base, which would include terms that are approved by specialists and such a database would then need to be used when translating (2005: 49). She also claims that the organization with the most experience would be the Centre of Translation and Terminology (Tulkošanas un terminoloģijas centrs) due to its accumulated experience from translating more than 100 000 pages of ES legal acts (ibid).

The newest technologies and social networks have created some solutions for these problems. Translators and interpreters use forums and the networking platform Facebook to exchange information of the preferred terms and their usage. Thus, professionals faced with these problems have created groups to share their knowledge and this could lead to a more centralized and a more widely available system in the future. Veisbergs agrees that a more centralized approach should be developed in which terminologists, translators, interpreters and field specialists would have better cooperation between them to ensure better problem solving ('Interpreting and the Latvian Language: Linguistic Aspects', vvk.lv). Communication and a more centralized process should be developed in the future.

Concerning the future development of terminology in Latvia, Ieva Zauberga proposes two ideas in the book *Translation theory for professional interpreters and translators* (2016). The first is to mend the gaps in the terminology field by increasing the job amount for terminologists and to look towards the future not the past (Zauberga, 2016: 68). Perfectionism trying to fix already existing terms may prove to be unproductive, therefore, the approach should be prospective not retrospective (ibid). The second is the suggestion to consider terms as communicative elements that ease communication between professionals; thus, term use should be approved by everyone not imposed by a few (ibid). These ideas are relevant to translators and especially interpreters who above all else use terms as communicative elements. And these terms and their use affect the language of the interpreter, i.e. the interpreted text.

2.5. The Interpreted Text and Terminology

The Interpreted Text is a separate text type, which has unique characteristics such as pausing and intonation that does not exist in an original text because 'it is steeped in a bilingual or multilingual environment' (Riccardi, 2002: 22). According to Riccardi (2002), these characteristics occur because the Interpreted Text is tightly linked with the Source Text, which has a different rhythm and pauses. When terminology is mentioned in the source text it is usually rendered with an emphasis or at least it is advisable to do so.

Alessandra Riccardi (2005) mentions the study of specific terminology as one of the difficult aspects of the interpreting process. Riccardi analyses the strategies for evolving simultaneous interpreting competence and describes the output of a professional interpreter. According to Riccardi the output consists of ready-made phrases that the interpreter anticipates ad separates this from other information. Interpreters 'select information units separating known information, usual in a given communicative setting, from new information conferring a unique character upon a speech portion, such as names and specific references, devoting greater attention to the latter' (Riccardi, 2005: 760). This shows how interpreters constantly switch from meaning-based interpreting to form-based interpreting when interpreting numbers, proper names and terms.

The retrieval and use of terminology in a simultaneous interpreting process in time becomes an automatic process. What is more, terms when part of the interpreted text require extra attention, because special emphasis is necessary when interpreting these lexical elements, especially crucial it is when producing a relay-interpreting text (Riccardi, 2002: 23).

It requires great skill to adequately apply terminology in an interpreting situation and the interpreter can use different techniques as to how to translate the term. This process can cause problems for the interpreter and affect the output quality.

2.6. Output quality and terminology

The researcher Sylvia Kalina (2002: 125) presents the dimensions of the interpreter's output quality to distinguish between several elements that affect it.

Semantic content	Linguistic performance	Presentation
consistency	grammatical correctness	voice quality
logic, coherence	adherence to TL norms	articulation
completeness	comprehensibility	public speaking
accurateness	stylistic adequacy	discipline
unambiguity	terminological adequacy	simultaneity
clarity	discretion	technical mastery
reliability	lack of disturbances	conduct

Table 2.1, The dimensions of the interpreter's output (Kalina, 2002: 125).

The three-dimensional view on the interpreter's output allows to analyse the interpreter's work with terminology in greater detail by distinguishing the three key aspects: semantic content, linguistic performance and presentation. Terminological adequacy is listed among the elements of linguistic performance and the aspect of unambiguity in the dimension of semantic content. This table shows the importance of terminological adequacy as well as the unambiguity of terms as important factors. These two can be analysed and developed in the preparation phase of the interpreting process, while the simultaneity aspect which is linked to the previous two elements is based on the interpreter's skill level, which has been mentioned by Riccardi (2002, 2005).

To sum up, the present chapter has outlined the importance of terminology in the work of an interpreter. The development of the conference interpreting affected numerous fields including terminology. The standardization and equivalence of terminology became important factors in facilitating communication between specialists, which is mediated by interpreters. Terminologists, translators and interpreters have overlapping tasks but their approach to terminology is different. According to Ieva Zauberga (2016) the way interpreters approach terminology collection and use is different to that of a translator. Furthermore, the terminology collected during the preparation phase affects the output quality. Thus, an analysis of available terms is necessary to assess the situation in terminology.

The following chapter encloses the methodology of the present research.

3. METHODOLOGY

The current chapter describes the methodology created by the author of the present research. The methodology is based the research of Ieva Zauberga (2016), Jānis Sīlis (2009), Andrejs Veisbergs (2009; 'Interpreting and the Latvian Language: Linguistic Aspects', vvk.lv), which describe an interpreter's use of terms, and the research of Jennifer Pearson (1998), who defines the text types that include reliable terms. Articles are selected from the technical blogs of the software company *Autodesk*, which is the leading manufacturer of software that is used in creating digital art. Terms are selected, then definitions and Latvian equivalents are found and analysed. The terminology problems are identified based on the created glossary (Appendix 1).

3.1. Research material

The empirical part of the present research includes the analysis of terminology problems in the field of digital art. The problems are analysed from the perspective of an interpreter. According to Ieva Zauberga (2016), interpreters use terms as communicative units. Also, interpreters apply different strategies than translators or terminologists when creating glossaries. Interpreters focus on the terms variants used by clients and the respective field specialists and professionals. The interpreters reflect these aims in their work before the interpreting assignment, i.e. preparation phase. In order to create material that would help in the interpreting process, interpreters may use different source materials, which are then analysed and a glossary is then compiled. The sources must contain reliable terms used by the field professionals, e.g. technical blogs.

3.1.1. Technical blogs

Technical blog is 'a blog where people write about IT related technologies and about the happenings in the fast-changing world', and it covers a 'range of topics in the IT world like Internet security, web hosting, new algorithms, etc.' (Gadhikar, Mohan, Chaudhari, Sawant & Bhusara, 2013: 61). These blogs, also called tech blogs, are places where learners, professionals and experts share information on topics related to their sphere of knowledge. They are especially popular among digital artists who use technology and software as tools to create their work, i.e. digital art work. These digital artists include animators, special effects creators, architects that create visualisations and engineers creating digital objects. All of them use specific software that make their work possible.

The software developers have to ensure that their work is always up to date with the newest technologies. And to make sure that digital artists find out about the updates and know how to use them, they publish blogs and tutorials. According to Gadhikar et al. (2013: 60):

> *Some developers may want to share their technical knowledge so that it can be of help to the other developers. For example, a developer might have found out a more efficient way of doing a certain task and may want to share this knowledge with other developers. He will be able to do so conveniently with the help of technical blogs.*

All of these developers aim to create a user-friendly environment so that more artists would understand how to use the software and apply it in their work. The accessibility and user-friendliness are the key factors. These same principles made the use of technology applicable in the movie industry in the 1990s (Taylor, 2014). That development made digital art more popular and extended its application. Now the technical blogs make these technologies easier to use. These technical blogs then become the platforms where digital art makers can communicate on the techniques, effects and tools of creating the end-product.

One of the most prominent software companies that create software for digital artists is *Autodesk*. It also has integrated in its website several technical blogs each dedicated to a different digital-art-creating software (e.g. *Autodesk Maya, Autodesk 3D Max*). Technical blogs, including those of *Autodesk,* enclose texts that are produced by professionals and intended to be read by professionals and others with sufficient knowledge in the type of technology discussed. These texts, according to the researcher Jennifer Pearson (1998), are part of *expert-expert communication* and the communication between *experts and initiates.* Both types of communication differ in the amount of terms and specialized jargon used. Nevertheless, the terms found in these types of texts are reliable due to being 'defined prior to the communication act by an external authority', e.g. a standardizing body (Pearson, 1998: 36). Pearson concludes that both of the communication types are 'reliable sources for potential term candidates, and that when terms are used within these contexts, we can assume that the people using the terms accept the stipulated and agreed meaning associated with these terms' (1998: 39). The blog posts chosen as the corpus in the present research belong to the text types of *expert-expert* and *expert-initiates* communication. These text types are reliable sources for terms, which can be used in the process of interpreting.

3.1.2. *Autodesk*

The technical blogs chosen for the present research are created by the *Autodesk* platform, which is one of the leaders in numerous digital art fields. 'Autodesk is the leading software developer for computer-aided-design (CAD) and computer animation' (2015, Eva Köppen 'Autodesk: A Design-Driven Company'). And according to their website it is 'a leader in 3D design, engineering and entertainment software' (autodesk.com). The software company representing the digital art fields were selected due to their wide-ranging application. The 3D design technologies are applicable in creating movies, visualizations for architects and used in training professionals, such as medical staff and army personnel.

Autodesk software has received numerous awards in the above mentioned digital art fields. The software-created works have received Oscar awards in the visual effects category and the technical category due to achievements in rendering (2017, 'Autodesk Artists & Developers Take Home Two Oscars', digitalmediaworld.tv). *Autodesk* software products (i.e. *Autodesk Maya, Autodesk 3D Max*) are leaders in 3D animation ('Top 11 3D Animation Software Companies' By Technavio, June 4, 2015). And they have become leaders in both design software products and manufacturing by creating the 'first real mainstream CAD (computer-aided design) system' (July 9th, 2015, '3 Reasons that Autodesk has Become the Manufacturing Leader', cadcamstuff.com). Also, *Autodesk* software products are leaders among 3D printing software tools, that prepare 3D models to print (May 22, 2017, Bulent Yusuf, '20 Best 3D Printing Software Tools', all3dp.com). Altogether, *Autodesk* is an important player in the digital art software field. The software programs it creates have gained prominence, therefore, artists are using it all around the world.

Autodesk is a leader in computer animation software, 3D printing software, visualisation software, and design software. The tools the company has created span various fields that apply and create digital art. The tech blogs created as part of the *Autodesk* platform include terminology used when creating digital art, which is the terminology that appears in conferences and other settings where digital art professionals meet.

3.2. Term types and term selection

For the purposes of the present research 19 articles were selected from the technical blogs created by the *Autodesk* team. The author of the current research selected the articles published over the span of two months, from February 20, 2017 to April 20, 2017. The articles are selected based on the terms they included. From the 19 articles, 109 terms are selected. The selected terms

are subtechnical or general terms and technical terms. These two types are not separately listed in the glossary or separately analysed in the analysis. According to Jennifer Pearson (1998) technical terms exist in one subject domain, while subtechnical terms are 'words which have special reference but which are used in more than one subject domain' and the researcher claims that by excluding them from a lexicon of a special subject field would mean distorting it (1998: 13). Lexicographers when creating specialized dictionaries sometimes may distinguish between the two term types and separate them or even exclude the generic terms. However, Pearson explains that terms are different and encourages to use an inclusive approach to selecting them, because this approach is better for the user of the selected terminology (Pearson, 1998: 8). In order to show the entire scope of terminology present in the articles, the subtechnical or general terms are included. When an interpreter prepares for an interpretation assignment he may structure the glossary according to the topic or may highlight the initial letter, but not to structure it according to the type of term it is. As the glossary is aimed to be a material used in the interpretation process, the distinction between generic terms and technical terms will not be shown.

Professionalisms are included into the glossary in order to portray the professional lexis of the field specialists. In doing so the list reveals a complete picture of terms that are likely to appear during an interpreting assignment on digital art. In cases when search results reveal one source with a single term equivalent in Latvian, a note is added in the comment column. This column includes notes on sources, i.e. whether they were reliable or if the term equivalent was used very rarely. Also, the column includes notes on whether it is the author's neologisms or if the term equivalent is dated or not as widely used as others.

3.3. Term display

Interpreters create the glossaries before interpretation to create an in-depth understanding of the topic and to use it during the interpretation. These glossaries are used when interpreting consecutively, during chuchotage, and when interpreting simultaneously in the booth. When interpreting simultaneously terms need to be accessed immediately. Today computers and tablets are used to access terms immediately using the find tool. Printed glossaries are also popular as they allow to quickly jot down some additional things on the margins. The term list needs to be as simple as possible. If a colleague in the booth needs to find a term equivalent, that should be available as soon as possible in print or digital glossaries. Other glossaries using the nesting principle create small pockets or nests of similar terms connected by one term element. This is a useful method to

prepare for an assignment, but to be used in the booth it may create added confusion. Therefore, the terms are displayed in a regular table including four columns: English term, Latvian equivalent(s), definition and comments. The column of comments is added for the purposes of the present research to show some additional information concerning the selected terms.

3.4. Sources

The author of the present research faces two challenges concerning the sources of definition and term variants in Latvian. The definitions are in English, taken from reliable sources, i.e. academic research, online encyclopaedias. The author received help from digital art creators concerning the precision of the definitions and the professionalisms used in the field. The sources of term variants found in Latvian are:

- The database of The Terminology Commission of the Academy of Sciences of Latvia, termini.lza.lv,
- The terminology database *IATE* (InterActive Terminology for Europe), iate.europa.eu,
- The online dictionary *Letonika*, letonika.lv,
- The English dictionary and translation search *Linguee,* linguee.com,
- The online dictionary *Glosbe,* glosbe.com,
- Google search results, e.g. websites, online publications, articles, blogs, forums, academic research, technical descriptions.

These sources are used by interpreters to find out term equivalents in Latvian. The term databases and dictionaries provide the official and approved terms, while the wider research in translation search engines (*Glosbe, Linguee)* provide the term variants and contexts in which they are used. If the term is not found in any of the dictionaries or translation sites providing term equivalents in Latvian, then the Google search results are analysed. Blogs, forums and web articles add professionalisms and occasionalisms to the list.

To sum up, the author uses 19 technical blog entries published by the online platform of the *Autodesk* software company. The technical blogs are chosen based on the period of their publication, i.e. from February 20, 2017 to April 20, 2017. They are chosen for the purpose of providing an objective sample of the digital art terminology. The 109 terms that were selected are compiled in a chronological order and the glossary contains four columns. The first column encloses English terms, the second Latvian terms, the third one definitions in English, and the

fourth show comments concerning different aspects of the selected Latvian term equivalents, e.g. the reliability of term equivalents or their use.

The following chapter includes the empirical analysis of the research.

4. ANALYSIS OF TERMINOLOGY PROBLEMS IN THE DIGITAL ART TERMINOLOGY

In order to answer the proposed research question, the author of the current research analyses the terminology problems found when compiling the glossary on digital art terminology. The 109 terms are analysed according to the criteria provided in the first two chapters. The problems found when compiling the glossary are divided into subchapters, which describe various terminology problems faced by interpreters.

4.1. Parallelisms

The phenomenon of synonymy has been widely discussed and researched. The current research includes several cases where the synonymic nature of Latvian terms can cause problems in the process of interpreting. In cases where synonymic variants are found in preparation phase, the interpreter then needs to answer the question which variant to use. In some instances, the client or the speakers can be asked about the terms, but not always. As the variants are numerous, the interpreters must decide which can be used in the interpreting assignment. One solution would be to use the more popular one, with the most results on a search engine, e.g. google. But problems may arise when the term is not officially accepted and the client might complain. Another solution would be to select the variant approved and advised by the term banks, but this term might be completely unknown to the listeners which in their professional setting use a different term. It is important to define several features that create the inconsistent use of term equivalents.

4.1.1. Developing technology

The problem of parallel variants face those terms that denote computers and other technology that is constantly developing and changing. This is the case with the terms *desktop software* (Design Visualization and VR: What's happening now, and what's next?, 2017) *handheld* and *virtual reality (VR) headset* (Baumann Larsen, 2017). *Desktop software* can be defined as a software that runs on a Mac, Windows or Linux desktop computer that is set up for use in one place (Elmblad, 2017). A *handheld* is any portable device that can be carried and held in one's palm, primarily designed to provide a suite of computing (handheld, 2017). And a *VR headset* is a device comprising of a stereoscopic head-mounted display, stereo sound, and head motion tracking sensors (Ben Kuchera , Jan 15, 2016 , 'The Complete Guide To Virtual Reality In 2016').

The last term represents the newest concept among them and the search did not reveal an official equivalent in Latvian. There exist several variants, i.e. *Virtuālās realitātes brilles, virtuālās realitātes radioaustiņas, virtuālās realitātes ķivere.* All the variants try to describe a concept. The variant *virtuālās realitātes radioaustiņas* has taken the term *headset* and applied it in the context of virtual reality technology, which is incorrect. The headsets comprising of a microphone and headphones do not represent the main feature of the VR headset, which is the stereoscopic display. The variant *virtuālās realitātes ķivere* describe the visual appearance of the item, which may change over time and create further problems. Therefore, the more popular variant *virtuālās realitātes brilles* is the one that most closely represents the concept.

In the cases of the first two terms (*desktop software, handheld),* they denote older concepts. The equivalents for *desktop software* are *galddatoru programmatūra, darbvirsmas programmatūra, darba virsmu lietojumprogrammatūra;* and the equivalents of handheld are *rokas ierīce, rokas dators, plaukstdators.* The parallel variants show inconsistency in translating and applying the concept. Further analysis should be created to define and create available standardized equivalents. Another term that should be similarly analysed and standardized must be the term *surround sound.* It is not a new concept, but it has a wide variety of parallel variants in Latvian, i.e. *pilnapjoma skaņa, fona skaņa, telpiskā skaņa, aptverošā skaņa, "surround" tipa skaņa, vides skaņa*. This inconsistency and lack of available official term equivalents create confusion. People do not know how to call it in Latvian and interpreters are not sure which equivalent to use in an interpreting assignment, which can then lead to the further establishment of borrowings or use of untranslated English term to denote the concept. The equivalent *"surround" tipa skaņa* already show this trend.

Therefore, there is a difference when looking at new concepts and older ones.

New concepts

The field of digital art is evolving and the newest technologies connected to creating virtual environments has seeped into the mainstream digital art movements. This affects the term equivalents appearing in Latvian. Due to the interest of the new technologies more articles appear talking about the effects, types and even dangers of, for example, virtual reality products. When these terms are translated appear new equivalents that then continue to spread.

The most prominent of these is the term *head-mounted display* (HMD) (Baumann Larsen, 2017), which is a type of computer display device or monitor that is worn on the head or is built in

as part of a helmet ((head-mounted display, 2017). This term has numerous equivalents in Latvian - *galvas displejs, pie galvas piestiprināms displejs, pie galvas stiprināms displejs, pie galvas piestiprināms ekrāns.* The equivalent *galvas displejs* is the official, approved term. Others try to describe the concept using the word *ekrāns* or the borrowing *displejs,* which is directly taken from the English term. In this case the approved variant is the shortest and most user-friendly of the parallel forms. The other variants show the tendency to describe a term in another language instead of creating a functional, usable term. In the limited time-frame of interpreting assignments this trend is problematic. Therefore, the creation and accessibility of the term *galvas displejs* is a very positive thing.

Two other new concepts are struggling to maintain term equivalents without parallel variants. These are *augmented reality (AR)* (Design Visualization and VR: What's happening now, and what's next?, 2017) and *mixed reality (MR). Augmented reality* is an enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device (augmented reality, 2017). It also denotes the technology used to create augmented reality. The term has two parallel variants - *paplašinātā realitāte* and *papildinātā realitāte.* The term database *IATE* gives the equivalent *paplašinātā realitāte,* while the Latvian Academy of Sciences terminology commission database provides the term *papildinātā realitāte.* Both sources were added in different times, the Latvian Academy of Sciences terminology commission in 2012 and IATE one year earlier. According to professionals working in the field in Latvia, the term *papildinātā realitāte* is more popular. Both sources are reliable, which calls into question the appearance and parallel existence of these two variants. This case shows the lack of communication still existing between term dictionaries. In order to maintain consistency one of the terms, preferably *paplašinātā realitāte,* need to be re-examined.

The other term that is in a similar situation is *mixed reality (MR)* ((Baumann Larsen, 2017). Mixed reality is a type of hybrid system that involves both physical and virtual elements (mixed reality, 2017). Here only one term is accepted – *jauktā realitāte* – while the parallel variant exists in numerous other sources, e.g. articles and the Wikipedia page. In numerous other sources the borrowing-based term *miksētā realitāte* is added alongside the term *jauktā realitāte,* which show the parallel variant becoming as widespread and accepted as the approved term. In other reliable sources the use of *miksētā realitāte* show that by using the borrowing, the abbreviation MR can be maintained in Latvian, which is another factor affecting the work of an interpreter, which will be discussed later in the chapter.

4.1.2. General terms

Parallelisms appear in different circumstances caused by several factors. When the concept term denotes is broad, with a wide application, it is hard to keep consistency and use one term. It is the case with the terms *lag* (Doyle, 2017) and *feature* (OConnor, 2017). Numerous equivalent variants appear creating an air of confusion. Both of these terms are general terms. *Lag* is a slow response from a computer (lag, 2017), while the term *feature* is a notable property of a device or software application (feature, 2017). Both are noun terms and both are often used in the field of digital art. The term banks and translation platforms offer numerous Latvian equivalents. The parallel variants for *lag* are *aizkavējums, aizture, izturējums, kavējums, nosebojums.* And the equivalents for *feature* are *pazīme, iezīme, funkcija, raksturiezīme.* According to the field specialists, the term *aizkavējums* is more precise and more used in the digital art field. While the most used equivalent for *feature* is *funkcija,* even though the approved terms are *pazīme* and *pamatiezīme.* These parallelisms show how hard it is to define general terms that function in several domains.

The term motion graphics is one of the terms, which is widely used is *motion graphics.* Motion graphics are pieces of digital footage or animation which create the illusion of motion or rotation, and are usually combined with audio for use in multimedia projects (motion graphics, 2017). Due to its application in movie making many of the term equivalents in Latvian are linked with the word cinema (kino), i.e. kinografikas, kino grafikas. In cases of animation and 3D, the term *kinografikas* is less applicable as *kustīgās grafikas.* Thus, when the term variants appear they do in a space where the other variants are not as accurate.

4.1.3. Technical terms

In other cases, the parallel variants appear because the particular technical terms are rarely used, which means that there are no entries in term banks and people who may use the term create their own variants. This is the case with the term *early adopter* (Baumann Larsen, 2017). It is a person who starts using a product or technology as soon as it becomes available (early adopter, 2017). The information on early adopters is used in calculating the projected success of a product because they are the first ones to try it and give feedback. Afterwards, the technology may be enhanced and further developed. The concept is important in a narrow field of specialisation. Few

sources include the Latvian equivalents (*pirmais lietotājs, agrīnais adaptētājs*), which are more likely to be occasionalisms.

These examples show that numerous factors affecting the creation of parallel variants in Latvian. The following subchapters enclose a further analysis on the types and features of parallel term variants in Latvian. Other technical terms are *mesh* and *quad*. *Mesh* is an object whose surface contains faces, each of which is described by a simple polygon (mesh, 2017). *Mesh* has three equivalents in Latvian - *režģis, tīkla režģis* and *tīklojums*. The term *režģis* appears in many reliable sources, e.g. in scientific research. Nevertheless, the other two also appear in reliable sources, but not as many as the first. And a *quad*, or quadrilateral, is a four-sided polygon; it creates a polygon mesh, which is a collection of vertices, edges and faces (quad, 2017). There exist two available equivalents, which are *četrstūris* and *kvadrāts.* Both of these equivalents are acceptable in the present context, but in order to maintain consistency within the field, there should exist only one equivalent.

The field of application in Latvia for these terms is so small that there are no real reliable variants yet developed. Therefore, further research in the technical terms would be advisable in order to create a more stable term domain.

4.1.4. Borrowings

Borrowings as parallel variants of Latvian term equivalents is one of the main problems in Latvian terminology. It can be seen in two noun terms *interactivity* (Baumann Larsen, 2017) and *modeler. Interactivity* is the ability of a computer to respond to a user's input (interactivity, 2017). The official accepted term equivalent in Latvian is *mijiedarbība,* which perfectly reflects the concept it denotes and appears in credible sources, e.g. in academic research. Nevertheless, the borrowing *interaktivitāte* is used in nearly all cases when taking about the digital sphere. Though in some cases the variant *mijiedarbība* appears, which is the approved variant, which appears in terminology databases and dictionaries.

The term *modeler* (Robinson, 2017) is another term that has two equivalents – *veidotājs* and *modelētājs.* A modeler is a person who creates object in the virtual reality (modeler, 2017). The English borrowing is more used than the Latvian term. According to the definition *veidotājs* is an acceptable equivalent to denote the concept of creating digital objects. However, the English borrowing is more popular and more used in this domain. The same situation faces the verb term *convert* (OConnor, 2017). To convert means to change data from one format to another (convert,

2017) and the term can be easily rendered into Latvian using the term *pārvērst.* The parallel variant is the borrowing *konvertēt*, which is not mentioned in the academic terminology database, but is extensively used and mentioned in other reliable sources.

Another borrowing that has become a parallel variant is the Latvian equivalent of *animator* (Obert, 2017). And animator is a person who makes animated films (animator, 2017). The Latvian equivalents include the descriptive term *multiplikācijas filmas autors*, the much more economical *multiplikators,* and the English borrowing *animators.* Professional discourse is flooded with the last variant and shows that borrowings are replacing the Latvian variants. The popularity of the borrowing *animators* is influenced by the relating words *animācija, animēt,* and others that have the same stem. Therefore, it is unlikely that the use of the borrowing *animators* can be limited.

Borrowings create parallel variants to approved and acceptable terms in Latvian. Nevertheless, due to the English filled software programs and the extensive use of English terminology, the borrowings are overtaking the Latvian terms. The English borrowings in computer terminology seem to become a standard. The standardization of terminology therefore must be as effective as possible to avoid further parallel structures from appearing.

4.1.5. Grammatically close parallelisms

Grammatically close parallelisms are those term variants that share the same stem but a different ending or other word elements. Thus, the morphological structure of the word is analysed and the parallel structures are assessed. The first term that has these parallel variants is *positional tracking* (Baumann Larsen, 2017), which is the detection of a precise position of the head-mounted displays, controllers, other objects or body parts within Euclidean space (positional tracking, 2017). This concept in Latvian exists in two variants - *pozīcijas izsekošana* and *pozīcijas sekošana.* The prefix *iz-* is seemingly redundant in the particular case, but the term variant *pozīcijas izsekošana* is more popular. This term appears in numerous reliable sources in Latvian, e.g. the Technical University of Riga website contains a reference to the variant *pozīcijas izsekošana*. The term *pozīcijas sekošana* only appears in an isolated source suggesting that it may be an occasionalism, even though both *sekošana* and *izsekošana* are accepted variants for *tracking.*

A similar term containing the same word *tracking* appears to have the same couple of term variants, i.e. *3D tracking*. It is the tracking of an object in a 3D environment (3D tracking, 2017). The parallel term equivalents are *3D sekošana* and *3D izsekošana.* In this case both variants are equally used, have similar number of sources, all of which are realiable, e.g. the webpage of the

institute of Electronics and computer sciences. The terms *sekošana* and *izsekošana* have not be standardized as both variants appear.

The term scripting language has three parallel variants, e.g. s*kripta valoda, skriptēšanas valoda, skriptošanas valoda*. Scripting language is a high-level programming language that is interpreted by another program at runtime rather than compiled by the computer's processor as other programming languages are (scripting language, 2017). All of the term variants have appeared in reliable sources, but one of these variants are grammatically incorrect. The verb term *skriptēt* appears in the term *skriptēta testēšana* showing the way the word is to be conjugated. Based on this analysis the grammatically correct variants are s*kripta valoda, skriptēšanas valoda,* which are both borrowings.

4.1.6. Outdated variants

The concept of new terms and concepts replacing the old ones is very prominent in the computer terminology. The first chapter of the theory enclosed a subchapter on the term *digital art.* The term does not appear in any of the articles but one of the elements described in it does, i.e. the adjective *ciparu*. The term digital asset has three equivalent variants in Latvian - *digitālie līdzekļi, digitālie aktīvi, ciparu aktīvi*. Digital assets (Creating big dumb VR joy: A word with Tyler Hurd, 2017) are any text or media that is formatted into a binary source and includes the right to use it (digital asset, 2017). The second term is the most reliable, nevertheless other two appear in reliable sources denoting the same concept. The term *ciparu aktīvi* like in the term variants of *digital art* and *ciparisks mākslas darbs*, the term *ciparisks* is outdated and not applicable in the case of digital art. Although *digitāls* is the borrowing of digital, the term variants enclosing the Latvian term *ciparisks* has become outdated. In the present context, the term *digitālie aktīvi* is the preferred variant due to its use in official documents, even though the adjectival element is a borrowing and the noun element is a calque.

Another dated term appearing in the glossary is the Latvian parallel variant *aprīkojums,* the equivalent in English is *toolkit.* A toolkit is a set of basic components for developing software (toolkit, 2017). The most used variant, which is also an official term is *rīkkopa.* These dated terms still appear in the terminology databases and, while it is important to provide possible translations of these terms in case they are needed, they need to be reviewed and a comment should be added to show their status. These outdated terms are necessary to be mentioned in term databases but their use should be limited to avoid unnecessary parallel variants.

4.2. Semantic closeness

Terms such as *virtual space*, *virtual reality* (Design Visualization and VR: What's happening now, and what's next?, 2017) and *virtual environment* (Doyle, 2017) are semantically similar and online these two concepts are interchanged, thus terms are used inconsistently and create confusion for interpreters.

The researcher Johnny Hartz Søraker has detected the same problem and his research *Virtual Entities, Environments, Worlds and Reality* (2011) tries to untether the inconsistent usage and meaning of the terms *virtual reality* and *virtual environment*. He defines *virtual environmen*t as 'an interactive, computer-simulated, indexical environment' and *virtual reality* as 'an interactive, computer-simulated environment experienced from a first-person view' (2011: 64). These definitions may vary in how they are described but the most important thing that they show is the element in which they differ. In this case, it is the concept of the first-person view. The *virtual environment* is a computer-simulated, interactive virtual environment that exists as a place where designers create virtual characters, models and objects. Whereas the virtual reality is the created reality viewed and experienced by the person using, for example, a head-mounted display (HMD). In short, the environment is created and the reality is perceived.

The definition of *virtual space* (Design Visualization and VR: What's happening now, and what's next?, 2017) is more difficult to pin down. In most cases the term *virtual space* is described as synonymous with *virtual environment*, while in others they are mentioned as separate concepts. This creates confusion for interpreters, who cannot understand the context of the terms. The term equivalents are very straightforward, i.e. *virtual environment – virtuālā vide, virtual space – virtuālā telpa.*

The inconsistency regarding the semantic closeness of these concepts can be explained by the fact that the technology they are linked to is very new. With the further development of 3D technologies these problems may be further analysed and the concepts alongside their definitions definitely will be revised.

Another term that has been discovered to be used interchangeably with another is the English term phrase *volumetric effects.* These are the visual effects induced by the light passing through media particles, e.g. gas, smoke, dust (*volumetric effects*, 2017). The volumetric effects are often used interchangeably with volumetric lighting, which more closely portrays the idea of the concept.

The Latvian equivalent is *tilpuma efekti,* while the equivalent for *volumetric lighting* also exists, i.e. *tilpuma apgaismojums.*

The problem with semantic closeness in the present glossary relates to concepts and terms which have recently appeared in the field of digital art (*volumetric effects*) or have become popular only recently (e.g. *virtual reality, virtual environment, virtual space*). The inconsistency in Latvian equivalents stems from the inconsistent usage of the terms in English. New concepts and ideas are discussed by numerous professionals and each seem to use a slightly different term to refer to the same concept. The author of the present research believes that with the development of technologies these inconsistencies will correct themselves.

4.3. The functional aspect

The functional aspects of terminology use demand that terms are economical. The glossary contains a few terms that do not follow this principle. The variants for *head-mounted display* have already been mentioned in the subchapter concerning parallelisms. Some of the variants that appear are not functional, e.g. *pie galvas piestiprināms displejs, pie galvas stiprināms displejs, pie galvas piestiprināms ekrāns*. Even though the official term (*galvas displejs)* contains a noun element, which is a borrowing (*displejs)*, from the point of view of functionality the official term *galvas displejs* is a better variant.

The term phrases *mobile VR* and *mobile VR devices* (Baumann Larsen, 2017) denote a new concept that appeared very recently. Mobile VR is an untethered VR experience in which the technology is based on a smartphone inserted to a VR headset (mobile VR, 2017). The equivalents in Latvian are long because they aim to explain the concept - *mobīlā telefona virtuālā realitāte, mobīlā telefona virtuālās realitātes ierīce.* These equivalents were mentioned in only few sources. The wish to explain a new concept is a logical choice; nevertheless, interpreters are faced with the need to communicate the idea in a limited timeframe, which may become complicated if the term equivalent is so long. Another term reveals the same problem – the term *desktop softwar*e (Design Visualization and VR: What's happening now, and what's next?, 2017). It is a software that runs on a Mac, Windows or Linux desktop computer that is set up for use in one place (Elmblad, 2017). The equivalents in Latvian are *galddatoru programmatūra, darbvirsmas programmatūra, darba virsmu lietojumprogrammatūra.* The last variant is an unnecessarily long explanation of the concept. The first two variants show that it can be much shorter and, therefore, more functional.

Another term that aims to explain the concept is the Latvian equivalent of *animator* (Robinson, 2017). An animator is a person who makes animated films (animator, 2017). The same definition is shortened and presented as an acceptable official equivalent in Latvian - *multiplikācijas filmas autors*. These longer variants do not promote the usage of Latvian terms and may further influence the usage of borrowings, which in the case of the term *animator* is already a dominating term in the digital art field.

Nevertheless, sometimes the longer variant becomes accepted and is widely used, which is the case with the verb term *stitch.* To stitch is to combine a series of elements into an individual, larger one, such as a series of photos into one panoramic photo (stitch, 2017). The equivalent phrase *veidot salaidumu* is longer than the English term, but it precisely denotes the concept and is widely used in the professional discourse.

4.4. Incorrect grammar

The glossary contains one term equivalent that is not grammatically correct. This is the case of the term *controller* (Baumann Larsen, 2017). A controller is a device that controls the transfer of data from a computer to a peripheral device and vice versa (controller, 2017). The equivalents in Latvian are *kontrolleris* and *kontrolieris*. The official variant, which is also the grammatically correct variant *kontrollers* is used alongside the variant *kontrolieris*. In Latvian, the term *kontrolieris* exists denoting a different concept. In Ltavian *kontrolieris* is a job title not an object. The approved term *kontrollers* and the variant *kontrolieris* are both English borrowings. The term *kontrolieris* is more widely known and used. This may be an influencing factor as to why the variant *kontrolieris* denoting a device that controls the transfer of data is more widely used, though being imprecise.

In the case where the popular usage is incorrect (e.g. *kontrolieris*), the interpreter has the responsibility to use the official and correct variant (e.g. *kontrollers*).

4.5. Borrowings

According to Ieva Zauberga (2016) and other researchers analysing computer terminology, this field is filled with English borrowings. In the rest of the cases presented in the current research, borrowings have been described as parallel variants to other Latvian terms. However, the glossary this paper contains also has several cases where a borrowing is the only available term equivalent in Latvian.

This is the case of the English noun terms *script* and *scripting.* Both of them are rendered in Latvian as borrowings – *skripts, skriptēšana.* A script is a type of program consisting of a set of instructions to an application or tool program (script, 2017). And scripting is the automation of user actions or the configuration of a standard state on a computer by means of scripts (scripting, 2017). Both of these Latvian equivalents are approved terms existing in the computer terminology field. While borrowings are seen as a negative trend in terminology, these borrowings are still an inevitable way of producing technical terms.

A similar case is with the English noun terms *rig* and *rigging* (Creating big dumb VR joy: A word with Tyler Hurd, 2017). A rig is a digital skeleton bound to the 3D mesh (rig, 2017). And rigging is a process of taking a digital sculpture and building a skeleton, muscles, skin of the character and adding a set of animation controls (rigging, 2017). The equivalent of *rig* is Latvian is *rigs.* This equivalent is mainly found in forums and some webpages. When it comes to *rigging,* the google search reveals two parallel variants, which are very similar, i.e. *rigings* and *rigošana*. The first variant is a borrowing which contains the root stem and the ending of the English term and has added only the Latvian ending -s. While the other variant contains only the root stem of the English term and a common ending -šana. Both are borrowings that do not reflect the meaning of the concept. While this may seem an acceptable solution of creating terms that have no other equivalents in Latvian, the Latvian terms do not reflect the origin of the English word. The term *rigging* alludes to the system of ropes and cables used to support and control the sails of a ship. This metaphor therefore is lost in the Latvian equivalent.

The glossary also includes two widely used concepts, who are rendered as borrowings in the target language, i.e. Latvian. They are *rendering* (Design Visualization and VR: What's happening now, and what's next?, 2017) and *interop* (OConnor, 2017). Rendering is the processing of an outline image using colour and shading to make it appear solid and three-dimensional (rendering, 2017). And interop is the technology that one software component uses to interoperate with another software component (interop, 2017). The term equivalent for *interop* is a direct borrowing *interop,* and the equivalent of *rendering* is *renderēšana.* The second term is rendered into Latvian by adding an ending -šana. Both borrowings are widely used and popular. The use of borrowings affects other words connected with the same concept, e.g. the noun *render*, which in the professional digital art discourse is used as *renderis*.

These borrowings in Latvian denote very narrow concepts that exist in programming and digital art and design fields. The negative trend noted by the author of the present paper is the loss

of metaphorisation in the terminology of the target language. Borrowings as the only available Latvian equivalents exist in order to meet the demand. Therefore, the speed of terminology development affects the types of terms used.

4.6. Lack of corresponding terms

Veisbergs has described the challenges that interpreters face when a term cannot be immediately rendered into the target language due to not being able to remember a term or not knowing the necessary term (Veisbergs, 'Interpreting and the Latvian Language: Linguistic Aspects', vvk.lv). The author of the present research faces similar challenges as several of the terms do not exist in Latvian. There are several variants how to solve this problem. One is to keep the untranslated English term in cases when the interpreter is sure that the listeners will understand the discussed term or concept. Another variant is to create an occasionalism, which is either is a form of a borrowing or a calque. As the current research deals with the creation of glossary as part of the preparation phase before the interpreting assignment, the author also presents suggestions for terms that have no available equivalents in Latvian.

The current subchapter reviews two variants of solving the problem, keeping an untranslated English term and creating a neologism.

4.6.1. Keeping the English term

Untranslated English terms appear often when researching the sources of several term equivalents in Latvian that are included in the glossary. These terms include *early-adopter, procedural (proxy) object*, *surround sound, mesh, quad* and others. These untranslated terms appear differently in the sources. In some cases, they are directly put in without any explanation, in other they are highlighted using the italics or bold tools. These two variants appear mainly in blogs and forums. The official documents found in the search result of *Glosbe* include the untranslated words in quotation marks (*'surround' tipa skaņa*).

These approaches are more applicable in translation than interpreting because the untranslated word then must be rendered using the original pronunciation. While in few rare cases the approach of keeping the untranslated term is a possible variant, the interpreter then must explain the untranslated term.

These examples show that the use of borrowings and the explanation of the concept is the preferred solution for interpreters.

4.6.2. Neologisms

The author of the present research has created 7 new neologisms in the field of digital art. The author has used various approaches to creating the neologisms in order to maintain consistency within the field. Seven neologisms are created for the terms *PC-based VR*, also, *PC-based virtual reality, rotational tracking, animation layer, atmospheric effects, room scale, sampling* and *spawning.*

The term equivalent for *PC-based VR*, also, *PC-based virtual reality* (Baumann Larsen, 2017) is *stacionārā virtuālā realitāte, stacionārā VR.* The term is created taking into account the other type of VR, which is Mobile VR. PC-based VR is VR experience in which the technology is connected to a PC (PC-based VR, 2017). Therefore, the term has to reflect the function of the VR technology being fixed or stationary.

The term *rotational tracking* (Baumann Larsen, 2017*)* also has no available equivalent in Latvian. Rotational tracking is a term used to describe how a piece of hardware determines how tilted something is (rotational tracking, 2017). The proposed equivalent is *rotācijas izsekošana.* The term *tracking* already exists in Latvian as *izsekošana*, therefore the author has created the term *rotācijas izsekošana* to maintain consistency within the field. The neologism is an English borrowing, which in this case is the preferred solution.

The term equivalents for *animation layer* and *atmospheric effects* (OConnor, 2017) are created based on the same principles as in the previous example. The animation layer is a layer containing an animation, i.e. a simulation of movement created by displaying a series of pictures, or frames (animation layer, 2017). And atmospheric effects are special effects that create wind, rain, fog, snow, clouds, etc (atmospheric effects, 2017). These two terms are rendered into Latvian using the principles of calquing and borrowing, *animation layer – animācijas slānis* and *atmospheric effects - atmosfēriskie efekti.*

Also, the neologism for *room scale* (Doyle, 2017) is a calque (*telpas mērogs*). The author has created a calque as it most closely reflects the concept it denotes. Room scale is a design paradigm for virtual reality (VR) experiences which allows users to freely walk around a play area, with their real-life motion reflected in the VR environment (room scale, 2017).

In the case of the term *spawning*, the author has taken one of the translations of the verb *to spawn* in order to create an applicable term equivalent. The neologism in Latvian is *vairošanās*. The neologism reflects the concept it denotes. In computer graphics particles are spawned, i.e.

generated, to create an effect, e.g. snow, rain, fire (spawning, 2017). The metaphor of the original English term is retained when creating the neologism .

The neologism for the term *sampling* is to be used in the digital art terminology. The term sampling already exists in the context of music mixing and other fields. However, the equivalent for the term in the digital art terminology is not available. Sampling in the present context is a process used to determine the colour of each image pixel of a digital image or object. The idea is that a colour is sampled or taken from one image pixel. Therefore, the neologism in Latvian is *iztveršana.* The Latvian variant reflects the principle at the core of the sampling process.

4.7. Calques

Calques dominate among the term equivalents in Latvian. These calques are equivalents of the following terms:

- virtual architecture - virtuālā arhitektūra,
- virtual environment - virtuālā vide,
- virtual space - virtuālā telpa,
- virtual reality – virtuālā realitāte,
- game engine - spēles dzinis, spēles dzinējs,
- texture mapping – faktūrkartēšana,
- loop – cilpa,
- cloud service – mākoņpakalpojums,
- digital assets – digitālie aktīvi.

While several researchers believe that the creation of calques is a negative trend, the above-mentioned examples show that the variants differ. Such equivalents as *mākoņpakalpojums* show that calques can precisely denote the concept. A cloud service (Introducing 3ds Max 2018, 2017) is a service made available to users on demand via the Internet from a cloud computing provider's servers as opposed to being provided from a company's own on-premises servers (cloud service, 2017). This example shows that the creation of calques is a positive trend in the computer terminology as it makes sure that metaphors are kept in the target language. Metaphors help to convey complex ideas using general concepts. This is a way to make sure that the technical concepts are understandable to the general public.

4.8. Abbreviations

The glossary included in the present master's thesis includes numerous terms and their abbreviations. It is important to include abbreviations because many of them are used more often than the full forms, especially in among professionals and experts. Such abbreviations include:

- CG (computer graphics) - The use of a computer to produce and manipulate pictorial images on a video screen, as in animation techniques or the production of audio-visual aids (computer graphics, 2017),
- VFX (visual effects) - a special effect that is added to a film or video in post-production, as computer-generated imagery, (visual effects, 2017),
- PC (personal computer) - a computer that uses a microprocessor and is designed for individual use, as by a person in an office or at home or school, for such applications as word processing, data management, financial analysis, or computer games (personal computer, 2017),
- HMD (head-mounted display) - a type of computer display device or monitor that is worn on the head or is built in as part of a helmet (head-mounted display, 2017),
- MR (mixed reality) – a type of hybrid system that involves both physical and virtual elements (mixed reality, 2017),
- AR (augmented reality) – an enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device; also, the technology used to create augmented reality (augmented reality, 2017),
- VR (virtual reality) - an artificial environment created with computer hardware and software and presented to the user in such a way that it appears and feels like a real environment (virtual reality, 2017),

The abbreviations are often used in both written and spoken discourse. This presents a challenge for interpreters, who have to decide on the best way to render the abbreviations in the target language. In the case of PC (personal computer) the terminology database of the Terminology Commission of the Academy of Sciences of Latvia provides a the same abbreviation PC in Latvian. The rest of the abbreviations can also be rendered in Latvian without keeping the English pronunciation.

Referring to the use of abbreviations in an interpreting assignment, the context is very important. The audience may be professions, who understand what the abbreviations denote. The

audience may also have only a vague understanding of the subject field and in this case the interpreter must decide whether to keep the abbreviation in Latvian, to provide the full term or to explain the concept.

Due to the fact that the technical blog entries contained only a few abbreviations, they are added next to the full terms in English. However, in the case where there are many more abbreviations, they are usually enclosed in a separate glossary.

4.9. Sources

The selection of sources for the Latvian term equivalents is one of the main challenges faced by the author of the present research. The reliability of sources is an important aspect to consider when creating a glossary.

When the interpreting assignment is on, for instance, the collection of products created by a particular company or manufacturer, the interpreter uses the terms and phases present in the documents and information platforms created by the company. In short, the interpreter applies the terms that the clients use (Zauberga, 2016). However, if these sources lack information then the interpreter must turn top other reliable sources, such as:

- The database of The Terminology Commission of the Academy of Sciences of Latvia, termini.lza.lv,
- The terminology database *IATE* (InterActive Terminology for Europe), iate.europa.eu,
- The online dictionary *Letonika*, letonika.lv,
- The English dictionary and translation search *Linguee,* linguee.com,
- The online dictionary *Glosbe,* glosbe.com,
- Google search results, e.g. websites, online publications, articles, blogs, forums, academic research, technical descriptions.

Some of these sources are not as reliable as others as they may contain occasionalisms or term equivalents not used by professionals. The term equivalents taken from blogs and forum threads may contain terms used by professionals of a specific field, but some of them may have official parallelisms.

As shown in the empirical part of the present research the sources may contain several variants. Some of them may be professionalisms (e.g. *rigging – rigings, rigošana*). Some may be occasionalisms as they appear only is a single source (e.g. *Lat-long space or spherical space –*

sfēriska telpa; matte painting – fona glezniecība). And some others may be official terms which are not used in professional discourse as in the case of the term *demo* (Obert, 2017*)* (EN)*,* where *demo* (LV) is used instead of *demontstrācija* (LV).

During the preparation phase the interpreter can prepare the terminology, research the term equivalents, and find out what sources are available and reliable. Even if the client sends the list of terms or the necessary materials to prepare, the problems discussed in the present empirical research also need to be addressed in order to make sure that the output quality is not diminished due to the incorrect use of terminology.

CONCLUSIONS

The present research has provided an analysis of the terminology problems present in the digital art terminology and has revealed how terminology problems affect the work of an interpreter. The paper gives an outline of the development of terminology and interpreting in Latvia and abroad, as well as providing information on the process of interpretation and the role of terminology in it. The author chose the topic of terminology problems in digital art terminology because the author has translated and interpreted digital art discourse and has faced the terminology problems present in the field. The author's aim was to find out how the terminology problems affect the output and quality of interpreting. Also, the author wished to create a glossary on the topic so that it could be used in future interpreting assignments.

The research questions are whether there are terminology problems in the Latvian digital art terminology, what are the terminology problems that exist in the field, how do they affect the work of an interpreter. The research questions are answered in the present research, which provides an analysis of the terminology problems found in the glossary, which comprises 109 terms. The findings reveal the terminology-related challenges that exist in the field of interpreting from English into Latvian. The author analyses the terminology problems mentioned in the secondary sources of the present research and those problems that the author faces while compiling the glossary on digital art terminology.

The main problems analysed in the research are parallelisms, borrowings, lack of term equivalents, calques and the problem of finding reliable sources. Parallelisms are described as the most pressing issue in the field of digital art. The author proposes the causes of the appearance of parallel variants. One of the causes is the rapid development of technology that affects the creation of new concepts and the need to quickly translate them into other languages. The creation of parallelisms, also, stem from the problems facing technical and general term rendering into the target language. Borrowings create parallel variants to official terms and outdated variants remain as parallel variants even though another term is generally used. Borrowings and calques are revealed to dominate among the Latvian term equivalents. And regarding the source problems, interpreters are often faced with the challenge of finding reliable sources for term equivalents. Sources may contain different term equivalents, such as occasionalisms, professionalisms or terms not used in professional discourse.

Other terminology problems include cases when terms are grammatically incorrect, when term variants are too long. Also, the appearance of abbreviations in the speech can cause problems for the interpreter. Professionals usually communicate among themselves using many abbreviations, which may be unknown to the interpreter.

Although, the author has selected several problems that are analysed using the examples from the created glossary of digital art, the author must state that the problems in the digital art terminology are few and not severe. The creation of calques and the maintaining of metaphors in Latvian computer and digital art terminology is not seen as a negative trend in the field, because metaphors are good tools for communicating complex concepts. However, the author acknowledges that the digital art terminology is negatively affected by parallel variants that are inconsistent and create problems for the interpreter. The author has created seven neologisms for terms, which have no available term equivalent in Latvian.

Terminology problems are affected by the rapidly changing technology in the field of digital art and the sometimes slow and inconsistent development and standardization of digital art terminology and computer terminology in Latvia. Consequently, interpreters and tranlators are faced with the task of carrying out terminological research. Interpreters need to apply terminology and know about the basic principles of terminology; however, the roles of an interpreter and a terminologist are not the same. The aim of an interpreter is to mediate communication using terminology.

The research has brought interesting results that should be further developed to analyse problems in digital art terminology. This research can be applied when creating information databases for interpreters. Based on the finding of the present paper, further topic of research may include the role of metaphors in digital art terminology. By understanding the issues facing interpreters when researching, collecting and analysing terminology, new approaches may be applied when creating information databases.

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THESES

1. Terms in the context of interpreting are seen as communicative and functional units. This approach is based on the pragmatic and functional theories, which stress the importance of terms in their contexts.

2. Interpreters use terminology to facilitate communication for other people and in order to create a clear message, understanding the context is key. To be able to interpret specific terminology the interpreter needs to know the context, the definition of the term, the concept it denotes and the equivalent in the target language.

3. The collection of terminology and creation of glossaries are important when interpreting scientific and technical discourse. The term collection is carried out in the preparation stage of the interpreting process.

4. The approach, use and collection of terminology are different for interpreters and translators. Interpreters apply those terms used by the client and the speakers, which means that the collected terms include professionalisms.

5. The author's qualitative research method reveals the problems in digital art terminology by analysing terms selected from technical blogs published on the online platform of the software company *Autodesk*.

6. When preparing the terminology for an interpreting assignment on digital art the interpreter is faced with several terminology problems, such as parallel variants, the use of calques, borrowings, the transfer of abbreviations, the lack of available term equivalents and the reliability of sources that contain term equivalents.

7. Due to technology, digital art terminology constantly changes making some concepts obsolete and creating numerous parallel variants for recently created concepts or technology.

8. The digital art terminology is dominated by parallel variants, borrowings and calques. Digital art terminology is in need of standardization to avoid the appearance of parallel variants and other problems in the future.

9. Not all calques represent a negative trend in terminology as in some cases the creation of calques carry metaphors, which are good communicators of complex concepts.

10. The detection of problems reveal the need for improvement and standardization in digital art terminology. The standardization of terminology and the creation of free access terminology databases improve the work of translators and interpreters.

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Appendix 1

Glossary

ENGLISH	LATVIAN	DEFINITION	COMMENT
3D model (5)	3D modelis	The product of 3D modelling.	
3D modeling (5)	3D modelēšana	The process of developing a mathematical representation of any three-dimensional surface of an object via specialized software.	
3D tracking (19)	3D sekošana, 3D izsekošana,	The location of an object in a 3D space.	
abstraction (5)	abstrakcija	The abstraction principle is used to reduce complexity and allow efficient design and implementation of complex software systems.	
agnostic (adj) (8)	neatkarīgs	Denoting or relating to hardware or software that is compatible with many types of platform or operating system.	
animation (12)	animācija	A simulation of movement created by displaying a series of pictures, or frames.	
animation layer (10)	animācijas slānis	A layer containing an animation, i.e. a simulation of movement created by displaying a series of pictures, or frames.	Author's neologism.
animator (2)	Animators, multiplikācijas filmas autors; multiplikators	A person who makes animated films.	

aspect ratio (16)	Proporcijas, attēla samērs, attēla formāts	The relative horizontal and vertical sizes.	In 3D and computer graphics the most precise equivalent is *proporcijas*.
asset, also digital asset (4)	digitālie līdzekļi, Digitālie aktīvi, ciparu aktīvi	Any text or media that is formatted into a binary source and includes the right to use it.	*Digitālie aktīvi* is the most reliable.
atmospheric effects (8)	atmosfēriskie efekti	Special effects that create wind, rain, fog, snow, clouds, etc.	Author's neologism.
augmented reality, AR (1) (5)	paplašinātā realitāte; papildināta realitāte; papildinātā realitāte, uzlabotā realitāte	An enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device; also : the technology used to create augmented reality.	
bezier curve (7)	Bezjē līkne	A parametric curve frequently used in computer graphics and related fields.	
clip (16)	Klips	A clip is a segment of video or media files containing video, audio, graphics or any other content.	
cloud service (7)	Mākoņpakalpojums	Service made available to users on demand via the Internet from a cloud computing provider's servers as opposed to being provided from a company's own on-premises servers.	
codebase, also, code base (n.) (8)	Koda bāze	A whole collection of source code that is used to build a particular software system, application,	

		or software component.	
computer graphics, CG (4)	datorgrafika	The use of a computer to produce and manipulate pictorial images on a video screen, as in animation techniques or the production of audio-visual aids.	
control points (16)	kontrolpunkti	Points used in the specification of curves to define the general required shape.	
controller (1)	Kontrolleris, kontrolieris	A device that controls the transfer of data from a computer to a peripheral device and vice versa.	The term *kontrolieris* is more widely used.
convert (v.) (8)	Pārvērst, konvertēt	To change data from one format to another.	*Konvertēt* is extensively used and mentioned in other reliable sources.
CPM (cost per impression) (14)	maksa par izdevumu	The cost an advertiser pays for one thousand views or impressions of an advertisement	
Demo (n.) (3)	Demonstrācija, demo	A partial or shortened version of a digital artwork distributed for promotion purposes.	*Demo* is more popular.
Demo (v.) (13)	Demonstrēt	Demonstrate the capabilities of (software or another product).	
desktop software (n.) (5)	galddatoru programmatūra, darbvirsmas programmatūra, darba virsmu lietojumprogrammatūra	A software that runs on a Mac, Windows or Linux desktop computer that is set up for use in one place.	
Digital art	1) datormāksla, digitālā māksla	Artform or an artwork created or modified using a	*Letonika* states that *digitāls mākslas darbs*

	2) digitāls mākslas darbs, ciparisks mākslas darbs	computer or another digital medium.	is not an advised variant.
dwell time (14)	Aiztures laiks	The period of time that a system or element of a system remains in a given state.	
early-adopter (1)	pirmais lietotājs, agrīnais adaptētājs	A person who starts using a product or technology as soon as it becomes available.	
edit (5)	redakcija	A version of written, recorded, or filmed material made as a result of editing.	
feature (8)	pazīme, iezīme, funkcija	A notable property of a device or software application.	
frame rate frames per second, FPS (14)	kadri sekundē, kadri/s, kadru ātrums	The number of video frames displayed per second. Higher frame rates generally produce smoother movement in the picture.	
framing (16)	kadrēšana	The presentation of visual elements in an image, especially the placement of the subject in relation to other objects.	
game engines (2)	Spēles dzinis, spēles dzinējs	The basic software of a computer game or video game.	*Spēles dzinējs* is more popular on google.
handheld (16)	rokas ierīce, rokas dators, plaukstdators	A handheld is any portable device that can be carried and held in one's palm, primarily designed to provide a suite of computing	
hardware (1)	datoraparatūra, datortehnika	The machines, wiring, and other physical components of a computer or other electronic system.	

hardware platform (1)	Aparatūras platforma, datoraparatūras platforma	A set of compatible hardware on which software applications can be run.	
head-mounted displays, HMDs (1)	galvas displejs, pie galvas piestiprināms displejs, pie galvas stiprināms displejs,pie galvas piestiprināms ekrāns	A type of computer display device or monitor that is worn on the head or is built in as part of a helmet.	*Galvas displejs* is the official term.
headset (1) (5)	austiņas; galvas tālrunis	A hardware device that connects to a telephone or computer that allow the user to talk and listen while keeping their hands free.	
import (v.) (10)	importēt	To bring information from one system or program into another. The system or program receiving the data must somehow support the internal format or structure of the data.	
impression (14)	Izdevums	The number of times a piece of social media content is seen by a user.	
interactivity (1)	Mijiedarbība, interaktivitāte	The ability of a computer to respond to a user's input.	
interop (8)	Interop	The technology that one software component uses to interoperate with another software component.	
interoperability (16)	sadarbspēja	the property that allows for the unrestricted sharing of resources between different systems.	
interpreted language (15)	Interpretējama valoda	A programming language for which most of its implementations	

		execute instructions directly, without previously compiling a program into machine-language instructions.	
lag (6)	aizkavējums, aizture, izturējums, kavējums, nosebojums	A slow response from a computer.	*Aizkavējums* is a more precise variant.
lat-long space or spherical space (19)	Sfēriska telpa	A 3D space in a form of a sphere onto which a monoscopic image is projected.	The Latvian term is found in a single source.
layer (10)	slānis	A level at which you can place an object or image file; layers can be stacked, merged or defined when creating a digital image.	
legacy (adj.) (8)	mantots	Of or pertaining to documents, data, software, or hardware that existed prior to a certain time.	
loop (n.) (10)	cilpa, cikls	A series of instructions that is repeated a fixed number of times or until a terminating condition is reached.	The term *cilpa* is more used.
loop (v.) (10)	atkārtot	To execute a group of statements repeatedly.	
matte painting (19)	fona gleznie cība	A painted representation of a landscape, set, or distant location that allows filmmakers to create the illusion of an environment that is not present at the filming location.	The Latvian term is found in a single source.
mesh (17)	režģis, tīkla režģis, tīklojums	An object whose surface contains faces, each of which is described by a simple polygon.	

metric (14)	metrika	A system or standard of measurement.	
mixed reality, MR (1)	miksētā realitāte, jauktā realitāte	A type of hybrid system that involves both physical and virtual elements.	
mobile VR, mobile VR devices (1)	Mobīlā telefona virtuālā realitāte, Mobīlā telefona virtuālās realitātes ierīce	Untethered VR experience in which the technology is based on a smartphone inserted to a VR headset.	Mentioned in few sources.
modeler (2)	veidotājs; modelētājs	A person who creates object in the virtual reality.	
modelling (7)	modelēšana	The activity of making three-dimensional models.	Appears in the Latvian term for *Virtual Reality Modelling Language.*
motion controller (13)	kustības kontrollers, kustību kontrollers, kustības kontrolieris, kustību kontrolieris	A device that detects a person's hand and body movement.	
motion graphics (12)	kinografikas, kino grafikas, kustīgās grafikas,	Pieces of digital footage or animation which create the illusion of motion or rotation, and are usually combined with audio for use in multimedia projects.	
parameter (10)	parametrs	A characteristic that is used to customize a program.	
particle (18)	daļiņa	Small, simple images or meshes that are displayed and moved in great numbers by a particle system, which is used in computer graphics to create physical phenomena, e.g. smoke, fire.	

PC-based VR (1)	Stacionārā virtuālā realitāte, stacionārā VR	VR experience in which the technology is connected to a PC.	Author's neologism.
personal computer, PC (1)	PC, personālais dators	A computer that uses a microprocessor and is designed for individual use, as by a person in an office or at home or school, for such applications as word processing, data management, financial analysis, or computer games.	
Photogrammetry (13)	fotogrammetrija	The method of scanning objects to automatically make 3D models of them.	
Platform (1)	platforma	A platform is a group of technologies that are used as a base upon which other applications, processes or technologies are developed.	
Plugin (8)	spraudnis	A hardware or software module that adds a specific feature or service to a larger system.	
polygon (17)	daudzstūris	A closed planar path composed of a finite number of sequential line segments. Used in computer graphics to compose images that are three-dimensional in appearance.	
positional tracking (1)	pozīcijas izsekošana, pozīcijas sekošana	Positional tracking detects the precise position of the head-mounted displays, controllers, other objects or body parts within Euclidean space.	

post-processing, also, postproc (13)	pēcapstrāde	Quality-improvement image processing used in real-time 3D rendering to add additional effects.	
Procedural (proxy) object (8)	Starpnieka objekts, proxy objekts	A proxy object acts as an intermediary between the client and an accessible object.	
programming language (2)	programmēšanas valoda	A system of precisely defined symbols and rules devised for writing computer programs.	
quad (17)	Četrsūris, kvadrāts	A quadrilateral, a four sided polygon. Quads create a polygon mesh, which is a collection of vertices, edges and faces. Faces consist of simple convex polygons, e.g. quadrilaterals.	
Real-time (n.) (1)	reālais laiks; reāllaiks	A level of computer responsiveness that a user senses as sufficiently immediate or that enables the computer to keep up with some external process	
real-time 3D (1)	Reāllaika 3D	Real-time operating systems are systems that respond to input immediately.	
real-time workflow (5)	Reāllaika darbplūsma	A process that receives immediate response and creates input immediately.	
Rendering (5)	renderēšana	The processing of an outline image using colour and shading to make it appear solid and three-dimensional.	

resolution (16)	izšķirtspēja	A measure of the fineness of detail in an image or text, usually as produced by a monitor or printer.	
Rig (4)	rigs	A digital skeleton bound to the 3D mesh.	
rigging (4)	Rigings, rigošana	Process of taking a digital sculpture and building a skeleton, the muscles, the skin to the character and a set of animation controls.	
Room scale (6)	telpas mērogs	A design paradigm for virtual reality (VR) experiences which allows users to freely walk around a play area, with their real-life motion reflected in the VR environment.	Author's neologism.
rotational tracking (1)	rotācijas izsekošana	Rotational tracking is a term used to describe how a piece of hardware determines how tilted something is.	Author's neologism.
Roto or rotoscoping (19)	rotoskopēšana	A technique that is used to create animation that mimics live action video.	
Sampling (8)	iztveršana	A process used to determine the colour of each image pixel of a digital image or object.	Author's neologism.
Screen (16)	ekrāns	The graphic portion of a visual output device or Surface unit.	
Script (n.) (8)	skripts	A type of program consisting of a set of instructions to an	

		application or tool program.	
Scripting (n.) (18)	skriptēšana	The automation of user actions or the configuration of a standard state on a computer by means of scripts.	
scripting language (15)	skripta valoda, skriptēšanas valoda, skriptošanas valoda,	A high-level programming language that is interpreted by another program at runtime rather than compiled by the computer's processor as other programming languages are.	
Shader (also, pixel shader) (8)	Ēnotājs, pikseļu ēnotājs	A graphics function which calculates computer image effects pixel by pixel allowing control of the lighting, shading and color of each individual pixel.	
Smartphone (1)	Viedtālrunis; viedais tālrunis	A mobile phone that performs many of the functions of a computer, typically having a touchscreen interface, Internet access, and an operating system capable of running downloaded apps.	
spawning (18)	vairošanās	In computer graphics particles are spawned, i.e. generated, to create an effect, e.g. snow, rain, fire.	Author's neologism.
Stereo or stereoscopy (16)	stereoskopija	Also, stereoscopic imaging, or 3D stereoscopic imaging is a technique used to record and display 3D (three dimensional)	The use of the shortened form *stereo* is ambiguous.

		images or an illusion of depth in an image.	
still (5)	kadrs	A single photographic print, as one of the frames of a motion-picture film.	
stitch (v.) (19)	veidot salaidumu	To combine a series of elements into an individual, larger one, such as a series of photos into one panoramic photo.	
surround sound (14)	pilnapjoma skaņa, fona skaņa, telpiskā skaņa, aptverošā skaņa, "surround" tipa skaņa, vides skaņa.	A type of audio output in which the sound appears to "surround the listener" by 360 degrees.	No definitive variant available in termbanks.
Texture mapping (13)	faktūrkartēšana	A graphic design procedure that involves a “texture map” (a 2-D surface) that is “wrapped around” a 3-D object.	
Tool (11)	rīks	A program that performs a very specific task.	
Toolkit (16)	Rīkkopa, aprīkojums (dated)	A set of basic components for developing software.	
Update (8)	atjauninājums	A change or addition to computer software that includes the most recent information.	
Vertex (7)	virsotne	A handle at intersections between segments, lines or curves that comprise a shape.	
virtual architecture (1)	virtuālā arhitektūra	Virtual architecture is the result of architectural design that serves its purpose as a digital representation.	
Virtual environment (6)	Virtuālā vide	An interactive, computer-simulated,	

		indexical environment.	
virtual space (5)	virtuālā telpa	Not physically existing as such but made by software to appear to do so.	
virtual-reality model; VR model; virtual model	virtuālās realitātes modelis; virtuālais modelis	A model created in the virtual reality.	
visual effects, VFX (4)	Vizuālie efekti	A special effect that is added to a film or video in post-production, as computer-generated imagery.	
Visualisation, visualization (5)	vizualizācija	A chart or other image that is created as a visual representation of an object, situation, or set of information.	
Volumetric effects (8)	Tilpuma efekti	The visual effects induced by the light passing through media particles e.g. gas, smoke, dust.	Volumetric effects are used interchangeably with the term *volumetric lighting (tilpuma apgaismojums).*
VR headset, virtual reality headset (1)	Virtuālās realitātes brilles, Virtuālās realitātes radioaustiņas, virtuālās realitātes ķivere	A device comprising of a stereoscopic head-mounted display, stereo sound, and head motion tracking sensors.	
VR, Virtual Reality (1) (5)	virtuāla realitāte; virtuālā realitāte	An artificial environment created with computer hardware and software and presented to the user in such a way that it appears and feels like a real environment.	
Workflow (5)	Darbplūsma, darba plūsma	A workflow process that is executing.	

Appendix 2

Dokumentārā lapa

Maģistra darbs „Terminology problems in the interpreter's work in the sphere of digital art" (Terminoloģijas problēmas tulka darbā digitālās mākslas jomā) izstrādāts LU Humanitāro zinātņu fakultātē.

Ar savu parakstu apliecinu, ka pētījums veikts patstāvīgi, izmantoti tikai tajā norādītie informācijas avoti un iesniegtā darba elektroniskā kopija atbilst izdrukai.

Autors: Asne Tirzīte 01. 06. 2017.,2

Rekomendēju darbu aizstāvēšanai

Vadītājs: profesors Dr. philol. Habil, Andrejs Veisbergs

Recenzents:

Studiju metodiķe:

Darbs iesniegts Sastatāmās valodniecības un tulkošanas nodaļā 02. 06. 2017.

Darbu pieņēma:

Darbs aizstāvēts maģistra gala pārbaudījuma komisijas sēdē

2017. gada…… jūnijā, prot. Nr. ….., vērtējums ……..

Komisijas sekretāre: