

## *Original Paper*

# Translation Theory Knowledge and Its Specific Applications in Modern Technology

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### **Abstract**

*The paper gives a clear, systematic discussion of the relationship between theoretical knowledge of translation and modern technology, first presenting the major translation theories and their key concepts: equivalence theory, skopos theory, and functionalism theory, and then proceeding to examine how each of these theories applies to machine translation, software and game localization, and cross-cultural communication in digital media.*

*Under the background of the rapid development of globalization and digitalization, translation activities play an increasingly important role in cross-cultural communication and information dissemination. At the same time, modern technology has developed at an unprecedented speed, profoundly changing the operation mode, transmission path and application scenario of translation. In this context, the relationship between theoretical knowledge of translation and modern technology becomes particularly complex and close. This paper focuses on this key field and analyzes the interconnections between translation theory and modern technology, with the aim of providing more in-depth and broad thinking and guidance for the development of translation and related practical activities.*

*The paper uses case studies and theoretical analysis to show clearly the guiding role of translation theory in translation practice under the conditions of modern technology, and then naturally proceeds to examine the problems and prospects arising from technological development for translation theory and practice.*

### **Keywords**

*Translation Theory, Modern Technology, Machine Translation, Localization, Cross-Cultural Communication*

## 1. Introduction

Technological progress has had a profound impact on the translation industry, but it is important to recognize that machine translation and digital localization do not render traditional translation theories obsolete; rather, they require the guidance of traditional theories for proper application. Therefore, this research rests on three clear, well-established theoretical frameworks: equivalence theory, skopos theory, and functionalist theory. Nida's equivalence theory emphasizes dynamic consistency in meaning and communicative effect over strict literal translation. Vermeer's skopos theory treats translation as purpose-driven cross-cultural communication, hence translation aims directly determine translation strategies. Reiss and Holz-Manttari's functionalism categorizes texts into informative, expressive, and operative types, and accordingly proposes different translation methods for different textual functions. Classical theories have clear and realizable value in modern technological contexts, but it is also well established that machine translation enhanced by AI and big data still has semantic and stylistic defects, hence equivalence theory is naturally a useful evaluation criterion for measuring linguistic and aesthetic quality, allowing for better optimization of translation algorithms. Moreover, skopos theory and functionalism provide direct and powerful guidance for software and game localization, since translators working in these domains must go beyond mere language conversion and take local culture, regulations, user habits, product purpose, and text function all into account when choosing translation strategies. Finally, digital media imposes higher standards on translation accuracy and cultural adaptability, and thus translation theories are indispensable tools for handling cross-cultural linguistic differences.

The paper skillfully combines theoretical analysis with case studies to investigate the relationship between translation theories and modern technology, and it clearly and logically presents the two sides of how technology affects translation research: on the one hand, massive digital data, cloud tools, and AI algorithms make resource gathering, academic collaboration, and theoretical application much easier, while also giving rise to new research areas such as game localization and virtual media. On the other hand, the rapid development of machine translation has naturally prompted important discussions about the future status of human translators, especially in light of the automation of routine mechanical tasks. Functionalist theory offers a very clear, principled way of classifying different text types: informative texts such as news reports and technical documents require factual accuracy and logical structure, expressive texts like novels and poems aim at aesthetic effect and emotional impact, hence requiring careful, nuanced linguistic treatment, while operative texts such as advertisements and political speeches are designed for persuasive effect, so they naturally call for cultural adaptation to address the intended audience. Skopos theory neatly extends this by advocating flexible strategy selection based on translation purpose: technical texts should be concise, literary texts should preserve artistic value, and marketing texts should use language that enhances persuasion.

Classic translation theories have a clear, ongoing guiding role in modern technological translation, and therefore the rational integration of traditional theories with digital technology is the best way to achieve precise, culturally appropriate, context-adaptive translations. More importantly, technological innovation

brings new requirements for theoretical development but also offers rich data and powerful tools for academic research, so constant refinement of translation theories is exactly what the digital era's cross-cultural communication needs demand.

## **2. Core Translation Theories and Their Concepts**

### *2.1 Equivalence Theory*

Equivalence theory, one of the most important and influential concepts in translation studies, was first systematically presented by the American linguist and translation theorist Eugene Nida, and it made a major breakthrough by foregrounding the notion of "dynamic equivalence", which he later appropriately renamed "functional equivalence". Most importantly, Nida's theory directly and powerfully challenged the conventional wisdom of strictly observing formal similarity between the source text and the target text.

Prior to the emergence of Nida's theory, translators generally adhered to the principle of literal and formal equivalence between the two languages in the translation process, therefore they usually attempted to match words and phrases one by one, seeking to produce a target text that reproduced the source text's syntactic structure, word order, and vocabulary literally. But Nida convincingly argued that this approach was extremely restrictive and did not address the real aim of translation, which is effective communication.

Nida made it very clear and logically consistent that translation is never a rigid word - for - word replacement between languages, but rather a dynamic, intricate process whose ultimate purpose is to achieve equal communicative effects. Therefore he naturally and convincingly concluded that the main aim of translation is to let target readers obtain substantially the same impression of the source text as the original readers do. Hence, the translation should match the original in emotion, meaning, and cognitive content.

Since it is clear from the discussion that Eugene Nida's equivalence theory has made a major contribution to the theory of translation, we may properly conclude that it offers translators a more complete, more effective method for translation, resulting in translations which are both accurate and suitably adapted to the target audience.

### *2.2 Skopos Theory*

Proposed by German scholar Hans Vermeer, Skopos theory has innovated traditional translation research. It abandons the rigid pursuit of literal fidelity and stresses that every translation activity is governed by a specific purpose. Determined by audiences, dissemination channels and usage contexts, translation purposes dominate translators' strategic choices. Instead of mechanically copying original texts, translators should ensure translated works function appropriately in target cultures.

Since the theory is extremely applicable to various translation situations, it is natural and logical to see how technical manuals emphasize clarity and accuracy, hence translators simplify jargon and use plain language to make the text easily readable for ordinary users. Literary translation, on the other hand, seeks

to reproduce the aesthetic appeal and emotional effect of the original by keeping its rhythm, tone, and artistic features intact. Marketing translation adapts language and cultural references to local preferences to make the message more persuasive and thus more effective for promotion.

Skopos theory offers a flexible, useful framework for translation practice, and it clearly and logically assigns the translation purpose a leading role, thus naturally leading to translations that are functional and appropriately adapted to their context. Moreover, the theory has the important effect of expanding the scope of translation studies and encouraging diversified, context-sensitive translation research.

### *2.3 Functionalist Theory*

Reiss and Holz-Manttari have presented a very clear, original analytical system for translation evaluation in their functionalist theory, which rightly rejects the traditional overemphasis on literal faithfulness and instead evaluates translation quality from the standpoint of how the translated text functions in the target culture. Hence, the theory naturally discounts rigid word-for-word translation.

A fundamental tenet of functionalism is the division of text functions into informative, expressive, and operative categories, so it is natural and exact to say that informative texts such as news reports and technical writings aim at presenting objective facts, hence translators must ensure accuracy and logical precision.

Expressive texts are literary texts such as novels and poems which embody the author's emotions and aesthetic intentions, hence translation of such texts should aim at preserving the original rhythm, imagery, and emotional tone rather than simply translating literal words. Therefore, competent translation requires good knowledge of culture and literature.

Since operative texts such as advertisements, speeches and legal papers are designed to influence readers' decisions, translators must preserve the original persuasive power and binding effect. Therefore advertising language should be appropriately adjusted to suit local cultural preferences.

Since functionalist theory gives very clear directions for translation practice, it is natural to conclude that translators can choose appropriate strategies in accord with different text functions, thus producing translations that are sensitive to context and suitable for the purposes of the target culture.

## **3. Application of Translation Theory in Machine Translation**

### *3.1 Principles of Machine Translation*

Machine translation systems are built upon a natural combination of statistical methods, rule-based approaches, and neural network technologies, but translation theory still offers crucial, well-founded principles for improving machine translation quality, particularly the concept of equivalence in translation theory, which is a very effective tool for evaluating the quality of machine-translated texts. Therefore, machine translation researchers aim to produce machine-translated text that is as equivalent as possible to the source text in both meaning and function.

### *3.2 Case Study: Google Translate*

Google Translate is one of the most widely used machine translation tools and employs neural machine

translation technology, hence its translation quality has improved substantially. But it is also well known that Google Translate occasionally gives literal translations of idiomatic expressions, which fail to capture the intended meaning. From the perspective of equivalence theory, the translator (here, the machine translation system) ought to find an equivalent expression in the target language. Therefore, incorporating more cultural and semantic knowledge into machine translation systems like Google Translate would directly and meaningfully improve their performance.

#### **4. Application of Translation Theory in Software and Game Localization**

##### *4.1 Importance of Localization*

Software and game localization entails more than mere translation; it necessarily involves adapting the product to the target culture, hence translation theory offers useful theoretical guidance for this process. Among translation theories, Skopos theory is especially pertinent to software and game localization because the clear purpose of localization is to make the product suitable for the target market, which naturally requires taking cultural differences, user preferences, and legal requirements into account.

##### *4.2 Case Study: Localization of Mobile Games*

Taking the localization of a popular mobile game from English to Chinese as a clear example, it is easy to illustrate that when translating in-game text, translators must make sure that the translated text is both grammatically correct and culturally suitable, since many English idiomatic expressions are not readily understandable to Chinese players. Therefore, from the standpoint of functionalist theory, the translators should select translations that convey the intended meaning and elicit the appropriate emotional reaction from Chinese players.

#### **5. Application of Translation Theory in Cross - Cultural Communication in Digital Media**

##### *5.1 Role of Translation in Digital Media*

Modern technology opens up very real and fruitful opportunities for the development of translation theories, since machine translation and digital media together generate vast amounts of multilingual data, which researchers then use to identify linguistic patterns, analyze translation errors, and thus summarize reliable strategies for different text types. Therefore, data-driven methods both validate traditional theories and naturally lead to academic innovation. Moreover, technology makes it easier for translators to access online dictionaries and corpora, and cloud platforms enable seamless cross-regional collaboration, both of which foster diverse translation practices and theoretical advancement.

Artificial intelligence opens up new and exciting possibilities for theoretical application: classic principles such as equivalence theory and skopos theory can be naturally and systematically embedded into intelligent algorithms, allowing translation tools to take communicative purpose, audience characteristics, and cultural context into proper account, thus producing more accurate, more culturally appropriate translations. Digital media also generates new translation demands in game localization, virtual reality, and online education, which has already prompted scholars to develop industry-specific

theoretical frameworks. But it is important to recognize that technological progress comes with its own challenges, so traditional theories must iterate regularly to remain adaptable to industry needs.

Machine translation is undoubtedly one of the most important and actively studied topics in modern translation research: AI-powered algorithms process massive texts at speeds unmatched by humans, thus being extremely useful for corporations dealing with international business documents. But there is also an obvious and growing concern that automated systems are gradually replacing repetitive translation work, which affects the occupational status of human translators. More importantly, machines lack cultural and semantic sensitivity, so they often fail to grasp idioms, contextual nuances, and cultural taboos, which can result in awkward or even offensive translations in diplomacy and marketing. Therefore, human-oriented translation theories must be adapted to the machine-dominated translation environment.

Digital media presents new and significant challenges for translation studies: social media platforms are replete with informal language, internet slang, and emojis, all of which are very different from conventional written texts, so traditional translation theories developed for formal discourse necessarily require adaptation to fit modern media characteristics. Moreover, online information spreads instantaneously around the world, hence translators must strike a careful balance between speed and accuracy to prevent the dissemination of misleading content and consequent reputational damage.

Since the internet has brought global communities extremely close together, cross-cultural communication demands have grown substantially, and therefore translation serves as a crucial cultural bridge that removes linguistic barriers for enterprises and individual creators alike. Yet it is also a fact that translators working in digital contexts routinely encounter cultural divergence and linguistic subtleties. Thus, Skopos theory provides a clear framework for adjusting cultural elements to meet local preferences in commercial promotion, while Equivalence theory offers practical guidance on selecting functionally equivalent expressions.

Since translation theories are extremely useful for translators in dealing with cultural, linguistic and temporal constraints of the digital age, and since a rational combination of traditional theories with modern technology yields accurate, culturally appropriate, and efficient translations, it follows that such optimized translation practices promote global cross - cultural understanding and foster international cooperation.

### *5.2 Case Study: Social Media Translation*

Since information spreads extremely fast on social media, translators must translate posts and comments in a timely manner, and according to equivalence theory, the translated text should be semantically and tonally equivalent to the original. Therefore, when translating a humorous post, the translator ought to seek equivalent humorous expressions in the target language in order to preserve the original communicative effect.

## 6. Challenges and Opportunities for Translation Theory in the Era of Modern Technology

### 6.1 Challenges

Although there are certainly some drawbacks, technological development provides very clear and fruitful opportunities for improving translation theories: mass multilingual texts produced by machine translation and digital media serve as large-scale corpora, which scholars use to examine linguistic patterns, translation errors, and exemplary translations, thereby validating and refining traditional theories, uncovering new linguistic phenomena, and naturally leading to genuine theoretical innovation. Reiss and Holz-Manttari have proposed a very clear, well-organized functionalist theory of translation which evaluates translations in terms of textual function rather than literal faithfulness, hence naturally leads to the conclusion that the practical utility of translated works in target cultures is paramount and that rigid word-for-word translation should be rejected. The theory systematically divides texts into three types: Informative texts such as news items and technical papers are based on objective facts, so their translation should be precise and logically structured to prevent misrepresentation. Expressive texts such as novels and poems are concerned with aesthetic value, thus requiring translators to preserve the original emotion, imagery, and rhythm to retain literary charm. Operative texts such as advertisements and legal documents are meant to influence reader behavior, therefore appropriate cultural and linguistic adaptations are essential to maximize persuasion and practical effect. As a result, functionalist theory provides translators with a direct path to context-sensitive, purposeful translation.

Technology has a clear and beneficial effect on improving translators' working conditions: online dictionaries and corpora aid terminology verification, cloud tools facilitate real-time cross-regional collaboration, hence both diversified translation practices and theoretical improvement are naturally promoted. More importantly, AI technology extends the application of classic theories by integrating equivalence and skopos theories into intelligent algorithms, allowing translation models to take communication goals and cultural context into explicit account when producing translations. Furthermore, emerging industries such as game localization and virtual reality generate new translation demands, which in turn prompt scholars to develop specialized theoretical systems. Therefore, it is fair to say that technology presents both challenges and opportunities for translation research.

Technological progress has brought indisputable challenges to translation studies: AI-based machine translation processes massive texts at unprecedented speed, thus greatly facilitating international business communication for enterprises, but it also means that automated systems are increasingly replacing repetitive work, hence raising legitimate concerns about the future value of human translators. More importantly, machines lack cultural and semantic awareness, so they do not understand idioms, subtle contextual meanings, or cultural taboos, which makes them prone to producing inappropriate translations in diplomacy and marketing. Therefore, traditional human-centered theories must be systematically revised to fit the machine-dominated translation environment.

Digital media presents new and significant challenges for translation practice because social platforms make heavy use of slang, emojis, and abbreviations, which are very different from formal written texts,

hence traditional translation theories need to be optimized to deal with informal digital discourse. Equally important is the fact that online information spreads extremely rapidly, so translators must achieve greater speed without sacrificing accuracy to avoid the risks of misinformation and reputational damage in the digital age.

### *6.2 Opportunities*

Although there are certainly existing difficulties, modern technology opens up very clear and substantial opportunities for the development of translation theories, and the most important advantage is the huge amount of translation data generated by machine translation and digital media, which produce multilingual texts continuously, thus forming rich, readily available translation corpora. Researchers can therefore analyze linguistic patterns, typical errors, and successful translation cases with much greater precision. More importantly, large-scale data analysis enables the determination of appropriate translation strategies for different text types and language pairs, making the data-based approach ideal for validating, refining, and even innovating traditional translation theories.

Technological progress has clearly facilitated translators' access to a wide range of linguistic resources: the Internet makes it possible for translators to instantly consult online dictionaries, corpora, and translation memories, thus making terminology confirmation easier and keeping them better informed about linguistic trends. More importantly, cloud-based tools have greatly promoted cross-regional collaboration among translators, as practitioners can share materials, discuss problems, and give feedback in real time. Therefore, diversified translation practices emerge naturally, and translation theory can iteratively evolve accordingly.

Because emerging technologies such as artificial intelligence and machine learning lend themselves to theoretical application, it is natural and fruitful to combine them with classic translation theories like equivalence theory and skopos theory to develop better intelligent translation tools. More importantly, algorithms informed by theory can take translation purpose, target reader, and cultural context fully into account, thus producing more accurate, more appropriate translations.

The expansion of digital media has given rise to new translation demands in emerging areas such as game localization, virtual reality products, and online education materials, and hence has directly encouraged scholars to investigate the distinctive industry characteristics of these domains and to develop targeted theoretical frameworks. More importantly, technology itself offers both obstacles and opportunities for translation research, so the proper response is to embrace technological advances and let translation theories iterate and refine themselves in line with the modernizing translation industry.

## **7. Conclusion**

Since the translation industry has developed profoundly under the influence of AI, big data and digital platforms, it is natural to ask whether traditional translation theories are still applicable to modern translation practice, and the answer is resoundingly yes: Nida's equivalence theory offers very clear and practical guidance for machine translation. However, it is also indisputable that current machine

translation has not fully captured the original text's meaning, style, or cultural implications, hence equivalence principles provide a solid basis for establishing evaluation criteria and identifying algorithmic flaws.

Vermeer's Skopos theory is of fundamental importance for software and game localization because it leads naturally to the conclusion that translators should adapt their methods to different cultural contexts and user habits in order to fulfill the function of the product. Business software requires the use of standardized professional terminology, while game translation makes use of cultural references and humorous language to foster user immersion, and hence both approaches improve the usability and market appeal of the localized product.

Functionalist theory is very helpful for analyzing cross-cultural communication on digital media because social media and streaming platforms now dominate global information dissemination, and therefore texts encountered online call for different translation strategies: informative texts require precise factual rendering, while expressive texts aim at reproducing authors' emotions and writing styles. Hence the theory naturally leads to flexible, effective cross-cultural information transmission.

Since technological development brings inevitable problems for traditional theories, and the digital era imposes higher demands on translation efficiency while neural machine translation reduces human intervention, it is therefore natural that there is growing debate over the role of human translators and the relevance of classic theories in machine-dominated translation environments.

Since technology opens up new possibilities for theoretical evolution, it is natural to note that abundant digital data facilitates the verification, refinement, and generalization of traditional theories regarding translation, and that combining classic theories with AI leads to better intelligent translation tools. A clear illustration is embedding equivalence and skopos principles in machine translation systems.

Since the combination of translation theories with modern technology improves translation quality and meets the increasing demands of cross-cultural communication, it is natural and timely to investigate the application of translation theory in VR, AR and other emerging fields, as well as to develop digital-oriented theoretical frameworks for cultural exchange.

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