UNIT 10 TRANSLATION SERVICE

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10.0 OBJECTIVES

After reading this Unit, you will be able to:

- describe the quantum and importance of S&T literature published in foreign (non-English) languages;
- explain the need and importance of translation service;
- trace the historical development of translation service;
- identify organisations/centres and translation service available to solve foreign language problems;
- define machine translation systems;
- explain the types of the machine translation systems available for automatic translation of published documents as well as electronic texts such as translation of web pages, electronic chat and e-mail; and
- describe the role of library in facilitating translations.
10.1 INTRODUCTION

Progress of science depends on the access to published science and technology (S&T) literature. Published scientific literature serves as a foundation for further research in any area of scientific research. Access to this literature is, therefore, a fundamental right of researchers anywhere in the world. However, this is not true in practice. Over 50% of the scientific literature is published in languages other than English. The English speaking researchers do not have access to this literature unless it is translated in English. This problem was realised more acutely after the World War II, when government sponsored research got stimulus and great momentum. The seven major languages in which bulk of S&T literature published were English, Russian, German, French, Japanese and Chinese. No country, however advanced, could afford to ignore scientific information produced in other countries. So there has been a great demand from researchers for translation of research results published in languages other than English. Many documentation centres and special libraries attached to R&D organisations started providing translation service to their scientists on demand. The demand for translation was particularly more for the journal articles. The major abstracting services cover S&T literature published in languages other than English. These abstracting services provide abstracts in English of the articles published in other languages, so that scientists can judge the relevance of the article and get it translated if required. Similarly, for French and Russian speaking scientists, the major abstracting services in S&T are ‘PASCAL’ and ‘FRANCIS’ from INIST-CNRS, France in French language and ‘Refratrvnyl Zhurnal’ from VINITI, erstwhile Russia in Russian language. When erstwhile USSR launched the world’s first space satellite, the U.S. government looked for all sorts of explanations. One reason given for apparent Russian success was that Soviet scientists used the western literature, while western scientists did not use the Russian literature because they could not handle the Russian language. To solve this problem, the National Science Foundation undertook a large scale programme in support of ‘cover-to-cover’ translation of Russian publications. In India too NISCAIR (Formerly INSDOC) has been providing translation service from many foreign languages in English to the scientists since its inception in 1952.

Translation of the documents is carried out by the translators. For scientific translations, a translator should have a good knowledge of both the languages as well as of the subject to understand the terminology of the given subject. Earlier most of the translation work was done by the human translators. With the advent of computers, research in machine translation (MT) started by 1950s. Machine translation is the application of computers to the task of translating text from one natural language to another. During the last 70 years of research in machine translation has resulted in large number of MT systems for mainframe computer, personal computers and for the Internet.

In this Unit, you will study about translation activities around the world, research and development activities in translation, particularly, in machine translation and bibliographical control of translations carried out by various agencies in the world.
10.2 TRANSLATION PROCESS AND TRANSLATOR

Translation is the process of transferring the information contents of the text in one language (L1) into another language (L2). The former (L1) is called the ‘Source Language (SL)’ and the latter (L2) is called the ‘Target Language (TL)’. In the translation process, the language expert analyses the given text in the source language from various viewpoints including meaning, grammatical structure of the sentence(s), terminology, etc. and comprehends the information contents of the sentence(s). The more accurate the comprehension of the information contents of the sentence(s), the more precise will be its transfer in target language. If the translator fails to understand the message communicated by the source language, the information transferred into target language will either be distorted or inadequate. A translator, therefore, should have sufficient knowledge of the source language as well as of the target language. In addition, s/he should be a subject expert to understand the terminology of the given subject. Each discipline has its own peculiar jargons and terms and a good translator should have in depth knowledge of these terms in both the languages. Thus, subject knowledge is an essential requirement, specifically for translating S&T documents.

10.3 TRANSLATION METHODS

The appropriate method of translating any text depends on the material to be translated. Material in science, technology and social sciences is translated adhering to the contents of the original. This is known as literal translation. Literal translation is utilised for factual type of materials such as commercial correspondence, legal materials, technical materials as well as scholarly materials in the pure and applied sciences and social sciences whereas translation of materials in humanities such as novels, plays, poetry, films, television, radio, motion picture scripts and vocal music texts, etc. is literary translation. This type of translation differs from science and technology translation as here the style and techniques of expressing feelings are more important. Second difference is the delivery of material in target language. Translation of literary material is destined for mass consumption. On the other hand scientific, technical, legal and commercial materials are intended for the specialists in a given field. The other major difference is that science and technology translations are done once, while literary classics (such as novels, religious books like Bible, Bhagwat Gita, etc.) are repeatedly translated.

Self Check Exercise

Note: i) Write your answer in the space given below.
ii) Check your answer with the answers given at the end of the Unit.

1) What do you understand by ‘Literal Translation’ and ‘Literary Translation’? State the differences between the two.

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Various disciplines of science and technology (S&T) as well as newer interdisciplinary areas such as environmental studies, medical electronics, biotechnology, etc. are more in numbers than those in humanities and social sciences. Advances in these fields occur much more rapidly and must be reported to the researchers as soon as possible. Major share of research and development (R&D) funding also goes to these knowledge areas. However, great portion of S&T research is carried out in non-English speaking countries. Published literature is the most effective means of exchanging knowledge. Translations are the only solution in providing access to multi-lingual information resources.

The demand for translation service grew after the World War II. Several government departments, public sector organisations and R&D institutions around the world started having in-house translation facilities in order to cater to their own translation requirements. Translation units formed an integral part of documentation and information centre of the organisation. Two kinds of services were organised within the information centre. They are:

i) In-house translation service to cater to the local translation requirements of the organisation from a few foreign languages into English; and

ii) General translation service which provided translation service to any individual or organisation from large number of foreign languages into English or vice versa on payment basis (e.g. Foreign Language Translation Service of NISCAIR).

10.4.1 Translation Centres

In many countries national translation centres were set up to monitor translation activities in the country. These centres either carried out translation work themselves or acted as referral centres for collecting, processing and announcing the translations done by various agencies in the country. In this section you will study about the activities of some of the major translation centres which came up during 1950s and 1960s around the world.

In the United States, major translation efforts consisted of English language translation of S&T material captured during the World War II, sponsored by National Science Foundation (NSF) and Special Library Association (SLA). During this period a large number of foreign reports were being translated simultaneously by different organisations which resulted in duplication of translation efforts, amounting to waste of time and money. The need was felt to establish a clearing house for translations, where translations could be collected, processed, announced and copies supplied on request. In response to this need, two translation centres viz. Scientific Translation Center and SLA Translation Center (Later named as National Translation Center) were set up where translations could be deposited.

NSF funded ‘Scientific Translation Center’ which covered Russian type scripts and technical reports that were deposited in Library of Congress. This Centre was located in Library of Congress.
National Translation Center was founded in 1953 under the name of SLA Translation Pool. This Centre engaged in collecting and processing translations from western European and Oriental languages. The Center was located in John Crerar Library, Chicago.

Space research activities in Soviet Union followed by launching of Sputnik in 1957, rapid technology in Germany and latest advancements in Japan, as well as the intensified research in all countries around the world, resulted in the growth of publications. Almost 50% of the S&T literature was published in languages other than English. Industrial research facilities and government agencies increased their translation activities considerably. Consequently, the number of translations deposited in SLA Translation Pool grew. In 1957, the SLA Translation Pool changed its name to SLA Translation Center and expanded its activities to cover not only translations deposited with the centre but also those available from commercial translation agencies and professional societies. SLA Translation Center to fully serve its users, established exchange agreements with national groups and professional societies around the world, by means of which translations were deposited with or reported to the Center. New additions to the Center’s collections were announced in the monthly journal, Translation Register Index. This journal begun by the Special Library Association (SLA) in 1967 was transferred to National Translation Center in 1971. The SLA Translation Center became National Translation Center and was housed in John Crerar Library, Chicago. In 1989, The National Translation Center became part of the Library of Congress. In 1993, The Library of Congress closed the National Translation Center and holdings of the Center i.e. translations from 1989 to 1993, were transferred to Canada Institute for Scientific and Technical Information in Ottawa, Canada.

Translations held by ‘Scientific Translation Center’ were announced by the following indexes:

- Bibliography of Translations from Russian Scientific and Technical Literature (1953-1956).
- Translation Monthly (1955-58)
- Technical Translations (1959-1968)
- Translation Register Index (1967-86). This index merged with World Translation Index in 1987.

National Translation Center announced its translations by the following indexes:

- SLA List of Translations (1953-1955)
- Translation Monthly (1957-1858)
- Translation Register Index (1967-86). This index merged with World Translation Index in 1987.

England also witnessed similar translation activities. All the translations carried out by various agencies in the country were announced by British Library Lending Division, Boston Spa (now BLDSC) by the following publications:
• **NLL Translation Bulletin (1959-70):** This publication covered citations of translations of Russian articles, list of translations of Russian and other books as well as information about cover-to-cover translated journals.

• **British Announcement Bulletin (1971- )** covers complete list of translations done by British agencies.

**International Translation Center (ITC)** came into existence in 1961 (Formerly known as **European Translation Center**) in Delft, The Netherlands. The present name was adopted in 1975.

Europe too, realised the importance of access to S&T literature published in Asian and western European countries and felt the need for translation of this material. Consequently, large scale translation work was carried out, primarily from non-western languages (covering Russian, Finnish, Hungarian, Romanian, Chinese, Japanese and Arabic), by European nations. The target languages were English, French and German. To prevent duplication of translation effort and to exchange translations, about 20 western European countries in cooperation with OECD and the United States, established **European Translation Center (ETC)** in 1961. The participating countries had national centres which, together with ETC, formed an international translation network. The ETC acted as a referral center, maintained a central information file, distributed translations and announced all translations in the monthly **World Index of Scientific Translations and List of Translations Notified to ETC (1967-77)**. It also maintained lists of translators and translation agencies. In 1975, ETC expanded its activities to announce translations available from other countries also and was renamed as **International Translation Center (ITC)**. The name of the announcement bulletin also changed to **World Transindex** in 1977 (1977 to 1986). From 1987 this publication was renamed as **World Translation Index (1987 to 1997)**. International Translation Center published 10 issues of **World Translation Index (WTI)** per year. This index was computerised and produced by PASCAL system developed by CNRS-Paris. Translations were arranged according to COSATI Classification Scheme with source and author indexes and key to the organisations from where translations could be obtained. First issue of WTI provided list of cover-to-cover translated journals. WTI covered citations of cover-to-cover translated journals and ad-hoc translations of periodical articles, patents, standards, books, regulations, etc. International Translation Center did not translate but registered and indexed translations performed by cooperating institutions, firms and individuals who voluntarily deposited copies of the translations with the Center. WTI centralised translation announcements made by participating agencies. INSDOC (now NISCAIR) published **National Index of Translations**, a quarterly publication covering citations to translations done by INSDOC and other agencies in India. National Index of Translations was also sent to ITC for coverage in WTI.

By the end of 1990s, many of the major translation centres in various countries were no longer operational due to reduction in funding for information services. This resulted in significant decline in translations made on ad-hoc basis. ITC had to work hard to locate material for citations in WTI and subscription to WTI also steadily declined. This led to the closure of International Translation Center in December 1997.
Self Check Exercise

**Note:** i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

2) When did International Translation Center close its operation? What were its main activities when it was in operation?

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10.5 TRANSLATION CENTRES AND TRANSLATION SERVICE IN INDIA

In India several Governments and Public Sector Organisations, R&D institutions in S&T have in-house translation facility to meet their own translation requirements for limited number of languages. Some such organisations are BARC, DESIDOC, ONGC, BHEL, MECON and HAL.

10.5.1 NISCAIR Foreign Language Translation Service

NISCAIR (formerly INSDOC) has been providing translation service to S&T community since its inception in 1952. It caters to the translation requirements of National Laboratories, S&T Institutes, R&D Organisations, Corporate and Public Sector Undertakings, Universities, Research Scholars, etc. NISCAIR provides translations of S&T documents from 20 foreign languages into English. The languages include Chinese, Czech, Danish, Dutch, French, German, Hungarian, Italian, Japanese, Norwegian, Polish, Portuguese, Rumanian, Russian, Serbo-Croatian, Spanish, Swedish, etc. NISCAIR provides reverse translation (from English into foreign languages) also. Translation of English text (maximum of one page), into French, Russian and Spanish is undertaken on request. Translation of full English document into Japanese is provided on request. NISCAIR also provides interpretation services in Japanese language. Charges for translation services for different languages are available at NISCAIR website (http://www.niscair.res.in).

The translation work is carried out by experienced staff translators and panel of translators registered with NISCAIR. Since NISCAIR mainly deals with technical translation, most of the staff translators as well as panel of translators have postgraduate qualification in languages as well in subject disciplines. For selection of panel translator, language (target as well as the source language) and subject proficiency of the applicant is examined by giving her/him different types of technical documents for translation. The person is registered on the panel if s/he delivers quality translation, adheres to required time schedule and delivers translation in the required format.
Self Check Exercise

Note: i) Write your answer in the space given below.
   ii) Check your answer with the answers given at the end of the Unit.

3) Describe the translation service of NISCAIR.

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10.5.2 Translation Activities in Humanities and Social Sciences in India

No one fully understands the meaning of ‘Unity in Diversity’ better than people in India. There are twenty–four official languages recognised by Government of India. In addition to that, there are about 2000 dialects that have been recognised in India. Quite a lot of communication is done in English and most state governments function in their own regional languages. This situation demands an urgent need for translation of official documents. Apart from official documents, there is need for translation of text books, scholarly materials, literary materials, etc. In response to this need, a number of organisations in India are actively involved in translation activities in the fields of humanities and social sciences.

Some of them are as follows:

1) The National Council of Educational Research and Training (NCERT) and National Book Trust (NBT) are both engaged in translation of text books in various Indian languages. (http://www.ncert.nic.in/)

2) State Council of Educational Research and Training (SCERT) carries out translation work from English to regional languages and from regional languages to English. (http://www.edudel.nic.in/scert.html/)

3) Sahitya Akademi was established in 1954. It is a central institution for publications and promotion of literary activities in 24 Indian languages including English. The Akademi gives 24 annual awards to literary works in Indian languages. The Akademi has established four Centres for Translations in Bangalore, Ahemadabad, Kolkata and Delhi. In addition to this, it has an archive of Indian literature in Delhi. The Akademi also organises Target Language Literary Translation Workshops. One of the main highlights of the workshop is that the practicing translators work on a literary piece under the direction of the experts. The Akademi has organised such workshops in many Indian regional languages. (http://www/sahitya-akademi.gov.in/)

4) Central Institute of English and Foreign Languages (CIEFL) was set up in 1958. It has been renamed as English and Foreign Languages University...
(EFLU) in 2007. It has three campuses. The main campus is in Hyderabad. Its main objective is to bring about qualitative change in the standard of English teaching in India. To achieve this, it has devised various programmes in the areas of research, development and training. The university presently, conducts training courses in foreign languages including German, French, Russian, Arabic, Spanish and Japanese. The institute also carries out translation work.

([http://www.hyderabadeducation.net/university](http://www.hyderabadeducation.net/university))

5) Institute of Asian Studies, Chennai was set up in 1982 with the objective of strengthening the cultural ties between India and other countries of Asia. The Institute is involved in research, training, translation and publication activities in Asian languages. The Institute has eight research departments which have made significant scholarly contribution in their respective fields of studies. The Institute’s activities include the following: studies and research in Tamil, Kannada, Japanese, Telugu and also Buddhism as well as related translation and publication activities. In addition, the Institute is carrying out research in Manuscriptology and Folklore studies and translation activities related to these areas. The Institute is working on the following projects in translation field:

i) Tamil-Tamil-English Dictionary in 20 volumes.


iii) Encyclopaedia of the Folklore Culture of Tamil Nadu (English)

iv) Encyclopaedia of the Folklore Culture of Karnataka (English)


vi) Department of Manuscriptology is translating palm-leaf manuscripts into English.

vii) A translation project for translation of 12 holy books of Tamil Nadu into English and Hindi is in progress.

viii) History of Buddhism in South India in 4 volumes (English)

ix) Tamil Lexicography: Tamil text database has been developed. Computers are used to extract words and citations from the text. Historical development of the meaning of the words can also be traced. To support this work many existing Tamil dictionaries have been combined into one single database for a number of mono and bilingual Tamil dictionaries. ([http://www.xlweb.com/heritage/asian/](http://www.xlweb.com/heritage/asian/))

6) Indian Council for Cultural Relations (ICCR), an autonomous organisation of Government of India, is involved in India’s external cultural relations through cultural exchange with other countries and people. The Council’s headquarters are located in Delhi with regional offices in Bangalore, Chandigarh, Chennai, Cuttack, Guwahati, Hyderabad, Jaipur, Lucknow, Mumbai, Pune, Shillong, Thiruvanthapuram and Varanasi. The Council carries out literary translations of books and other documents to project Indian cultural heritage to the world. The Council’s translation and publication activities focus on books relating to Indian culture, philosophy, mythology
as well as traditional music, dance and theatre. The Council has translated many Sanskrit classics to number of foreign languages including French, Spanish, Arabic, Russian and English. (http://www.iccrindia.net/)

Self Check Exercise

**Note:**

i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

4) Enumerate the institutions involved in translation activities in humanities and social sciences in India.

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10.6 TRANSLATION SERVICE: PRESENT SCENARIO

At present most of the National Translation Centres which came up in various countries of the world are no longer functioning. International Translation Center also closed its operations in 1997. Some of the translations listed in various indexes produced by these translation centres are available at document supply centres such as BLDSC and CISTI.

**World Translation Index** database (online database of print publication of World Translation Index) is available for online searching through a vendor, DIALOG. (Dialog file 295. Period covered is 1979-1997). The database contains bibliographical references to both original and translated documents, reflecting translation announcements collected by International Translation Center. More than half of English translations are from documents originally published in Russian and almost 30% are from Japanese and German originals.

**Index Translationum** (1932+): Published by UNESCO, Index Translationum is an international bibliography of translations. It provides bibliographical details of books translated in the world into English covering all fields of knowledge. Each year, about 100 UNESCO Member States, send bibliographical details of books translated in their countries to the UNESCO Secretariat. UNESCO annually brings out Index Translationum in print. The Index Translationum was created in 1932. From 1979 onwards, UNESCO is maintaining a machine readable database of this index. This database has cumulative bibliographical information on the books which are translated and published in the Member States of UNESCO. The database has over 2,000,000 records. It is planned to update the database every four months. (http://www.portal.unesco.org/culture/en/…)

In India, NISCAIR continues to provide translation service as described in Section 10.5.1.
At present a large number of private translation agencies have come up in the world who offer translation as well interpretation services to advertising industry, media industry and publication industry. In addition, they also offer services to medical, educational and research institutes. The translation service of these private agencies cover administrative translation (translation of circulars, notices, etc.); commercial translation (translation of contractually binding documents); financial translation (translation of contracts, accounting documents, agreements, etc.); legal translation (translation of summons, complaints and other legal documents), literary translation (translation of literary text from one language to another language); technical translation (translation of technical documents related to research and specialised fields in S&T); clinical research translation (translation services for pharmaceutical companies), etc.

A number of such private translation agencies are listed on the Internet. For instance, Translation Directory.com (http://www.translationdirectory.com) on the Internet is a portal for language professionals and their clients. The portal provides details of over 7204 translation agencies and over 28714 free lance translators from 68 countries. The translation agencies are listed country wise. The agency details include agency name, contact person, e-mail address, URL, phone number, fax, postal address, language profile, etc. The details of free lance translators include resume of the translator, language proficiency and subject expertise. The portal lists over 558 translation agencies from India.

At present most of the government organisations in the world are funding mainly research projects in machine translation. In subsequent sections of this Unit you will study about machine translation activities in India and abroad.

10.7 MACHINE TRANSLATION

Machine Translation (MT) is application of computers to the task of translating text from one language to another. In MT system, the computer program analyses the text in one language - the “source language” and then produces the equivalent text in another language - the “target language”, without human intervention. Machine translation is also referred to as “automatic translation”. The systems for automatic translations have been under development for over 60 years. The first public demonstration of MT system was held in New York at the head office of IBM in 1954. This MT system translated 49 selected Russian sentences into English in the field of chemistry. This demonstration stimulated the funding of MT research not only in the U.S. but also worldwide.

Currently, the state of machine translation is such that it involves some human intervention at pre-editing or post-editing phase. This means the translation produced by MT systems must be revised or “post-edited” by human translators to achieve publishable quality. Sometimes, such revision may be substantial as MT system produces only ‘draft’ translation. In other words, machine translation is not perfect and as results will never be able to compete with human translator. However, in the fields with limited range of vocabulary and simple sentences, MT systems are producing good results. For instance, TAUM, a Canadian MT system, translates weather reports from English to French without any human intervention.

Earlier the MT systems were based on “direct” translation via bilingual dictionaries with very little analysis of syntactical structure of a language. By
1980s, advances in computational linguistics offered better facilities for machine translation. Rule-based method could be used to carry out machine translation. In these systems, the text of the source language is analysed into abstract representation of ‘meaning’ of the text involving number of programmes to identify word structure (morphology), sentence structure (syntax), recognise correct semantic relationship and distinguish between homonyms, phrases and other ambiguities. Syntactical analysis of a language involves identifying use or function of a word, phrase or clause in a sentence. For example, English word such as ‘light’, which can be a noun, adjective or verb; or ‘solution’ which can be a mathematical term or a chemical term; or ‘plant’ which can be a botanical term or industrial term. In other words, MT systems have adopted more a sophisticated approach to the task of translation. At present, most of the MT systems can be grouped into 3 basic system type:

i) Direct,
ii) Transfer, and
iii) Interlingua.

**Direct Translation:** The MT systems using only bilingual dictionaries. The best known MT systems for mainframe computers are of ‘direct translation type’ e.g. SYSTRAN, LOGOS, FUJITSU ATLAS Systems. They are, however, improved version of this type. They are highly modular in construction and easily modifiable and extendable. SYSTRAN system, originally designed for Russian to English, is now available for 52 language combinations. LOGOS originally marketed for German to English is also now available for other languages, such as English to German, Italian and Spanish and from German to French and Italian. FUJITSU ATLAS System translates from English to Japanese and from Japanese to English.

**Transfer Approach:** In this approach there are three basic stages: i) analysis of input text into abstract source representation, ii) transfer to the abstract target representation, and iii) generation into output language. Transfer model is shown in the Fig. 10.1 below:

![Fig.10. 1: Variants of Transfer Model of Machine Translation](image-url)

(Source: Tucker, Allen B. (et al.)
In this system three dictionaries are needed: i) a source language dictionary (SD), ii) a target language dictionary (TD), and iii) a transfer dictionary i.e. bilingual dictionary (STD). Source language dictionary (SD) analyses the source language text, sentence by sentence. Bilingual dictionary transfers the analysed source text into target language. Then target dictionary generates the text into target language. In this type of system, transfer stage requires bilingual dictionary for each set of language pair. In a multilingual environment, the number of transfer blocks required would be equal to the number of languages a MT system covers. METAL from Siemens Company from Germany (Now with GML and LANT Company) is a commercial MT system based on the ‘transfer’ approach.

**Interlingua Approach:** In this system the source text is analysed into abstract representation, which is designed to be a kind of language independent ‘Interlingua’ and can serve as an intermediary between large numbers of natural languages. Here the translation is done in two stages: i) from source language to Interlingua and ii) from Interlingua to the target language. Fig. 10.2 shows Interlingua model of machine translation. The example of Interlingua system is MT system by Cordier and Mograbhi which translates cooking recipes from French into Arabic.

![Interlingua Model of Machine Translation](source)

**Fig. 10.2: Interlingua Model of Machine Translation**
(Source: Tucker, Allen B. (et. Al.)

Apart from the above mentioned techniques of the MT systems, machine translation can be done by using other techniques such as rule-based translation, example-based translation and statistical machine translation.

**Rule-based Translation**

The most common technique to use MT is by coding grammatical rules of source and target languages in the software and get the translation done using these rules and dictionaries specifically created for this purpose.

**Example-based Translation**

The other technique to use machine translation is by storing the source and target language pairs as example base and then match the new sentences for similarities from the example base. Translation obtained from the best match is called Example-based Translation Method.

**Statistical Machine Translation**

In addition, statistical methods can be employed to increase the efficiency of the translation. Statistical Machine Translation is a relatively new technique. It is
not yet widely use. It uses collections of documents and their translations to ‘train’ software. Over time, these data driven systems ‘learn’ what makes a good translation and what doesn’t and then use probability and statistics to decide which of possible translations of a given word or phrase is most likely correct based on the context.

10.7.1 MT Systems for Mainframe, Personal Computers (PC) and the Internet

Most widely known commercial MT Systems like SYSTRAN, METAL, LOGOS and FUJITSU ATLAS initially developed for mainframe computers, have also brought out their PC based versions. SYSTRAN Company offers a wide range of PC products such as SYSTRAN Professional, SYSRAN Personal, SYSTRAN Office Translator and SYSTRAN Web Translator. The SYSTRAN MT systems with large dictionary databases and large number of languages have advantages over other PC based systems. At present, there are four types of translation demands from MT systems:

i) Use of MT for Dissemination;
ii) Use of MT for Assimilation;
iii) Use of MT for Interchange; and
iv) Use of MT for Information Access Systems.

i) MT Systems for Dissemination: This type of demand is made to have quality translation for publication purposes. To fulfil this demand, most of the MT systems produce translation which must be revised or ‘post-edited’ by human translators to achieve publishable quality. In recent years, the MT systems for dissemination purposes have been augmented by developments in translation tools (e.g. terminology databases, translation memories, etc).

ii) MT Systems for Assimilation: As mentioned earlier, MT systems produce draft translation and it must be revised by human translator to reach publishable quality. However, at times, users are satisfied with draft translation produced by MT systems because they can extract or assimilate what they need to know from the unedited version of the translation. With the coming of cheaper PC-based MT systems in the market, this type of use has substantially increased.

iii) MT Systems for Interchange: This demand is for translation of electronic text on the Internet, such as translation of web pages, electronic-mail and electronic ‘chat’. This type of demand is increasing rapidly. To fulfil this demand there is need for immediate translation to convey the basic contents of the message. Here, MT systems are playing major role, since they can operate virtually. These systems carry out translation in-real time and online. People are using MT systems for this purpose and have no objection to the poor quality of translation, because it fulfills their immediate need. Another area of MT research is the development of systems for spoken language translation e.g. in telephonic conversation and in business negotiations.

iv) MT Systems for Information Access Systems: This demand is for integration of translation software into: a) Systems for the search and retrieval of full-texts of documents from databases (e.g. retrieval of translated electronic version of journal articles in science, medicine and technology or
for retrieval of bibliographic information); b) Systems for extracting information (e.g. product details) from texts in particular from newspaper reports; c) Systems for summarising texts; and d) Systems for integrating non-textual databases. This field is the focus of a number of research projects in Europe. The aim is to provide access, to all members of European Union, to the sources of data and information, whatever may be the source language.

**Self Check Exercise**

**Note:** i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

5) **What is Machine Translation? Describe the types of translation demands, which present day MT systems are required to meet.**

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**10.7.2 Machine Translation Research in India**

India is a linguistically rich country with 24 official languages, each of which is spoken by millions of people in the country. Since most of the information is generated in English and English and Hindi constitute bulk of correspondence in government offices, these languages have been identified as priority area of research in machine aided translation in India. Accordingly, two specific areas of research have been identified:

i) MT systems for translation between Indian languages, and

ii) MT systems for translation between English to Hindi.

Realising the immense potential of MT, Department of Official Language (DOL), Government of India, began actively funding projects in MT research.

Currently, institutions in the country namely C-DAC, Mumbai and Bengaluru and IITs have taken the lead in developing MT systems. Ministry of Information Technology has identified the following domains for the development of domain specific translation systems:

i) Government administrative procedures and formats;

ii) Parliamentary questions and answers;

iii) Pharmaceutical information; and

iv) Legal terminology and judgments.

C-DAC (Centre for Development of Advanced Computing) Mumbai and Bengaluru (erstwhile National Centre for Software Technology (NCST) Mumbai) is a scientific society under the aegis of Department of Electronics and Information Technology. It is devoted to the research and development in the area of software technology. C-DAC has undertaken many projects and one of the projects in the
area of machine translation is called E-ILMT (English to Indian Languages: Machine Translation System). The members under this project constitute IITs, (Hyderabad, Mumbai, Allahabad) state universities (Jadavpur, Utkal) IISc Bengaluru and C-DAC, Mumbai and Pune. The scope of the project E-LIMT is to develop and design machine translation system from English to Indian languages in the areas of tourism and health care. The main objective of the project is to remove language barriers in a country like India where there are 24 official languages.

Department of Computer Science and Engineering of IIT, Kanpur has developed two machine translation systems for translating English text in Indian languages. These MT systems are ANGLABHARTI and ANUBHARTI. ANGLABHARTI system is based on pattern directed approach. This means that different patterns of source language are examined and stored in the system. Most of the translation job is done by the machine on the basis of the patterns stored in the system. Only 10 per cent work is done by human intervention in the form of post editing work. ANUBHARTI system of MT is based on example-based approach. This approach needs a database of examples for translation work.

‘Anusaarka’ is a machine translation system developed by Chinmaya International Foundation, IIT Hyderabad and University of Hyderabad, Department of Sanskrit Studies. Anusaarka is a Sanskrit word which means to follow. It is an English Hindi language accessing software. This helps the users to have access to the translated text in any Indian language from the source language(s) i.e. English or any Indian regional language.

The slow development of MT systems in India is due to lack of lexical resources for Indian languages. Indian groups are now addressing this challenge jointly by starting a collaborative open source initiative called ‘LERIL (Lexical Resources for Indian Languages), which includes several groups such as IIIT Hyderabad, NCST (now C-DAC Mumbai), Mumbai, Kendriya Hindi Sansthan, etc. Sharing of resources would help MT projects to take off at a faster rate. In conclusion, it can be said that India has made significant progress in MT research. Currently, Ministry of Information Technology is sponsoring about 75% of the MT projects in India. The Technology Development for Indian Languages (TDIL) Programme was launched by Ministry of Information Technology, Govt. of India in the year 1991-1992. The Programme aims at promotion and development of computer-based translation tools for Indian languages.

**10.7.3 Translation Service from MT Systems**

Search Engine like Google is offering rough automatic translation services for many languages. Google interface offers Google homepage, messages and buttons to display in 135 languages. It covers following Indian languages: Bengali, English, Gujarati, Hindi, Kannada, Malayalam, Marathi, Oriya, Punjabi, Sindhi, Tamil and Telugu. Many of the MT systems offer free translation facility on the Web. Listed below are some of these sites:
10.8 COMPUTER-BASED TRANSLATION TOOLS

It has been observed that professional translators spend considerable amount of time in consulting translation tools like technical dictionaries, such as monolingual, bilingual and multilingual dictionaries, glossaries, etc. to select appropriate terms and phrases while translating. They were waiting to have computer-based translation tools to speed up translation process. With the advances in computers and telecommunication technologies, the development of computer assisted translation tools became feasible.

10.8.1 Translation Workstation

Translation workstation offers combined access to computerised dictionaries, terminological databanks, multilingual word processing systems, the management of glossaries and terminological resources, appropriate facilities for input and output of text and translation memories. There are four main vendors of translation workstations and their products are as follows:

i) TRADOS 6 Multi Term Workstation;

ii) Transit XV Workstation from STAR AG Company;

iii) Translation Manager from IBM; and

iv) The Euro Lang Optimiser Workstation from LANT in Belgium (previously sold by SITE in France).

10.8.2 Translation Memory

Translation Memory (TM) is a software program designed as an aid for human translators. It consists of a database that stores text segments (which can be a sentence or sentence like units) in source language and their translation in one or more languages. Using TM, a translator can translate, save and reuse translated sentences and passages. TM saves pairs of terms or strings of texts and reproduces them when the same source language term or string comes along in any other position in the document being translated. This helps the translator become more efficient and consistent. In addition, a translator can always use the same TM for future translations and hence achieve consistency in terms of terminology and style across translation jobs. Other advantages of TM are: i) Consistency in common definitions, phrases and terminology when a number of translators work on a single translation project; ii) Speeding up overall translation process; and iii) Making the translation process cost effective for long term translation.

10.9 TRANSLATORS ASSOCIATIONS

Many countries have active national associations of translators, interpreters and terminologists which play a major role in improving the quality of translation and developing standards and recommendations.
In India, Indian Scientific Translators Association (ISTA) is dedicated to the cause of promotion of scientific translation in India. The main objectives of the association are to: promote facilities for scientific translation in India; improve the status and service conditions of scientific translators; promote training facilities for scientific translation; convene conferences or conduct seminar on scientific translation; bring out publications; and cooperate with national and international organisations with similar objectives.

At the international level, one such association is the International Federation of Translators, Interpreters and Terminologists (FIT). FIT has members from over 100 translators’ associations from all over the world. FIT unites these associations helping them to benefit from shared knowledge and experience. It aims to harmonise translation standards and seek conformity for translation quality criteria. It also encourages the establishment of new translators associations in countries where they do not yet exist and nurtures their early development. FIT maintains operational relations with UNESCO. (http://www.fit-ift.org/)

### 10.10 LIBRARY’S ROLE IN FACILITATING TRANSLATIONS

Libraries can play an active role in meeting user’s demands for translation. They should have information about translation pools, translation centres, professional associations, Government agencies, commercial publishers and their products (including cover-to-cover translated journals.), directories of translators and translating firms. The library should have these sources: both published as well as online, on up-to-date basis and it should be able to assist the users in identifying institutions holding the needed translations. If demands are very frequent, then library staff members or resource persons who are available when needed, should be able to either translate or abstract or provide summaries of the material needed to meet urgent need.

### 10.11 SUMMARY

Translation service is one of the most responsive services of libraries and information centres. The spectacular growth in information technology, the widening reach of the Internet, the expansion of trade globally and ever increasing scientific and cultural cooperation have undoubtedly increased the demand for translation service. However, reduction in funding for information services has resulted in significant decline in translations made on ad hoc bases. This perhaps may be one of the reasons which have led to the closure of International Translation Center as well as its prestigious publication *World Translation Index*.

Research in machine translation has resulted in number of MT systems for mainframe, personal computers and the Internet. The development of computer-based translation tools such as multilingual dictionaries, terminological databanks, multilingual word processing systems and translation memories are greatly facilitating the translation process for both human translators as well as for automatic translation. Demand for translation of electronic text on the Internet such as translation of web pages, electronic mail, and electronic ‘chat’ is rapidly increasing. Here, MT systems are playing major role by providing translation on line and in-real time. In India, research in machine translation is in progress in
two areas viz., MT systems for translation between Indian languages and MT systems for translation between English to Hindi. Currently, the institutions in the India namely C-DAC and Indian Institute of Technology are actively involved in MT research.

10.12 ANSWERS TO SELF CHECK EXERCISES

1) Literal translation is translation of exact words or contents of the original text without any exaggeration or imagination. Literal translation is utilised for factual type of materials such as commercial correspondence, legal materials, technical materials as well as scholarly materials in the pure and applied sciences and social sciences.

Literary translation is translation of materials in humanities such as novels, plays, poetry, films, television, radio, motion picture scripts and vocal music texts, etc. This type of translation differs from science and technology translation as here style and techniques of expressing feelings are more important.

Second difference is the delivery of material in target language. Translation of literary material is destined for mass consumption. On the other hand scientific, technical, legal and commercial materials are intended for the specialists in a given field. The other major difference is that science and technology translations are done once, while literary classics (such as novels, religious books like Bible, Bhagwat Gita, etc.) are repeatedly translated.

2) International Translation Center (ITC) closed its operations in December 1997. ITC was set up in 1961 as European Translation Centre in Delft, The Netherlands, to avoid duplication of translation efforts and to exchange translations. About 20 western European countries in cooperation with OECD and the United States established European Translation Centre (ETC). The participating countries had national centers which, together with ETC, formed an international translation network. The ETC acted as a referral center, maintained a central information file, distributed translations and announced all translations in the monthly World Index of Scientific Translations and List of Translations Notified to ETC (1967-77) and maintained lists of translators and translation agencies. In 1975, ETC expanded its activities to announce translations available from other countries also and was named as International Translation Center (ITC). The name of the announcement bulletin also changed to World Transindex in 1977 (1977 to 1986). From 1987 this publication was renamed as World Translation Index (1987 to 1997). International Translation Center published 10 issues of World Translation Index (WTI) per year. First issue of WTI provided list of cover-to-cover translated journals. WTI covered citations of cover-to-cover translated journals and ad-hoc translations of periodical articles, patents, standards, books, regulations, etc. International Translation Center did not translate but registered and indexed translations performed by cooperating institutions, firms and individuals who voluntarily deposited copies of the translations with the Center. WTI centralised translation announcements made by participating agencies.

3) NISCAIR (formerly INSDOC) has been providing translation services to S&T community since its inception in 1952. It caters to the translation
requirements of National Laboratories, S&T Institutes, R&D Organisations, Corporate and Public Sector Undertakings, Universities, Research Scholars, etc. NISCAIR provides translations of S&T documents from 20 foreign languages into English. The languages include Chinese, Czech, Danish, Dutch, French, German, Hungarian, Italian, Japanese, Norwegian, Polish, Portuguese, Rumanian, Russian, Serbo-Croatian, Spanish and Swedish etc. NISCAIR provides reverse translation (from English to foreign languages) also. Translation of English text (maximum of one page), to French, Russian and Spanish is undertaken on request. Translation of full English document to Japanese is provided on request. NISCAIR also provides interpretation services in Japanese language.

4) Institutions involved in translation activities in Humanities and Social Sciences in India are as follows:

1) National Council of Educational Research and Training (NCERT);
2) State Council of Educational Research and Training (SCERT);
3) Sahitya Akademi;
4) Central Institute of English and Foreign Languages (now English and Foreign Languages University (ELU));
5) Institute of Asian Studies; and
6) Indian Council for Cultural Relations (ICCR).

5) Machine translation is application of computers to the task of translating text from one natural language to another. In MT system, the computer program analyses the text in one language – the ‘source language’ and then produces the equivalent text in another language – the ‘target language’. Machine translation is also referred to as ‘automatic translation’. At present, there are four types of translation demands from MT systems. These demands are for:

i) Dissemination;
ii) Assimilation;
iii) Interchange; and
iv) Information Access Systems.

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<tr>
<th>10.13 KEYWORDS</th>
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<tr>
<td><strong>Computational Linguistics</strong> : Linguistic studies by use of computer to process and correlate linguistic data.</td>
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<tr>
<td><strong>Linguistics</strong> : Science of languages or having to do with language or study of languages.</td>
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<tr>
<td><strong>Linguistic Analysis</strong> : Breaking down of the elements of a language into basic units.</td>
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<td><strong>Semantics</strong> : Relating to meaning, especially of words.</td>
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<td><strong>Syntax</strong> : The positioning of words in a sentence and their relationship to each other.</td>
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<tr>
<td><strong>Translation Memory</strong> : It is software program designed as an aid for human translators. A translation memory</td>
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consists of a database of text segments in source language and their translation in target language. Segments can be individual words or multiword phrases. Using TM a translator can translate, save and reuse translated sentences.

Translation Workstation: Computer-based translation tools for professional translators consisting of dictionaries, terminological databases, multilingual word processing software, OCR scanners, laser printers and translation memories.

### 10.14 KEY TO ABBREVIATIONS

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>C-DAC</td>
<td>Centre for Development of Advanced Computing</td>
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<td>IIT</td>
<td>Indian Institute of Technology</td>
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<td>IIIT</td>
<td>International Institute of Information Technology</td>
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<tr>
<td>INIST-CNRS</td>
<td>Institute for Scientific and Technical Information-National Centre for Scientific Research</td>
</tr>
<tr>
<td>NCST</td>
<td>National Centre for Software Technology</td>
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<td>VINITI</td>
<td>All – Russian Scientific and Technical Information Institute</td>
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### 10.15 REFERENCES AND FURTHER READING


