UNIQUE APP FOR MULTILINGUAL TRANSLATION

A Minor Project Report

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For

The Award of Degree of

Bachelor of Technology

in

Computer Science & Engineering

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DECLARATION BY THE CANDIDATE

We the undersigned solemnly declare that the Minor project report entitled **"Unique App for Multilingual Translation"** is based on our own work carried out during the course of our study under the supervision of ***Asst. Prof. Taniya Jain .***

We assert that the statements made and conclusions drawn are an outcome of the project work. We further declare that to the best of our knowledge and belief that the report does not contain any part of any work which has been submitted for the award of any other degree/diploma/certificate in this University/Deemed university of India or any other country.

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This is to certify that the Minor project report entitled **"Unique App for Multilingual Translation"** is a record of project work carried out under my guidance and supervision for the fulfillment of the award of degree of Bachelor of Engineering in the faculty of Computer Science & Engineering of Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.) India.

To the best of my knowledge and belief the report

i) Embodies the work of the candidate himself

ii) Has duly been completed

iii) Fulfills the partial requirement of the ordinance relating to the B.E. degree of the University

iv) Is up to the desired standard both in respect of contents and language for being referred to the examiners.

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The project report entitled **"Unique App for Multilingual Translation"** has been examined by the undersigned as a part of the examination of Bachelor of Engineering in the faculty of Computer Science & Engineering of Chhattisgarh Swami Vivekanand Technical University, Bhilai.

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CHAPTER 1

ABSTRACT

1.1 Abstract :

A language translator is a mobile application that can be utilized for translating from English to any other dialect, and vice versa. The problem of language difference has hindered effective information communication over the years. There have been difficulties in information communication amid countries over the years. In modern times, language interpreters must understand and speak both the language been translated to and verse-visa. This traditional approach used for solving the problem of language differences has not been productive and favorable. Also, the teaching of different languages can be difficult due to language difference problems. The individual will also have to be taught by a tutor who will incur extra expenses and may not be the most efficient and favorable method. Therefore, the study develops an android phone language converter app in other to make learning and language translation easy and facilitates stress-free communication. The proposed language translation uses Microsoft's real-time translation API natural language processing with Java programming language to develop the application. The most used languages globally (i.e., English, Spanish, Arabic, Hindi, French, and Chinese) were used for the android application translation. This application can be useful for Tourists for communication purposes, thus allowing them to integrate with the local people and access the right information. The system will also be able to evaluate language translation to determine their suitability for everyday conversation; given the fact that it is an android application, one will always be willing to use their phone to learn, compared to having them on a computer or learn from a physical tutor when your phone can be your tutor. The application was evaluated based on the classification time the memory usage, and the battery life all through distinctive use.

CHAPTER 2

INTRODUCTION

2.1 Overview :

Because of the increasing utilization of mobile gadgets, the idea of mobile and omnipresent computation is becoming an extremely significant aspect of our daily lives due to its rising processing power, vast storage capacity, simple user experience, and enhanced network infrastructure. There is an increasing request for mobile utilization to sustain our day-to-day events and offer diverse amusement. Android is probably the most popular operating system that millions of smartphones and tablets are using today, and is increasing by leaps and bounds. Hence, the android phone is one of the most advanced and easiest-to-use tools. For the modern implementation of the education system, translation and language learning tools are needed. Often there is a boundary to the functionality and functions of current online submissions and a substantial increase in the number of cell phone apps providing such services. Machine Translation (MT) is an automated transformation of one natural language into another employing a computer. Arithmetical Machine Translation is a method to MT that is categorized by the utilization of machine learning approaches. There are nearly 6,500 spoken languages globally, and 4,500 of them have more than 1000 speakers. In information communication, language has been a significant barrier for centuries now, and human beings have always tried to provide a solution to the issues of language translation. Over the decade's humans have developed different ways of translating languages in order to solve the problems associated with language differences. The first approach which was implemented in solving this language problem was by using human translators that will be able to understand and translate both languages to the involved parties. This method was the first method introduced and has been used for decades, which has proven not to be the most efficient and effective method of language translation proven over the years. This method involves the translator being able to comprehend and express the language being translated and also understand and talk about the language of the party in which the language is going to be translated. Translation of languages is useful in many aspects, such as education. It is challenging to teach in a specific language if the people being led do not understand the language of the tutor. For the students to have a complete understanding of what they are being taught, an interpreter will be needed. In tourism, tourists may not be able to communicate with people successfully in the tourist country he visited, thus hindering communication.

2.2 Application :

In today's ever-changing business environment, more and more organizations are going global to expand their operations and reach a broader audience. It implies dealing with partners, customers, and employees of different cultures and languages. Connecting with such people in various countries across the world comes with a lot of challenges. The most common one is language barriers. Studies show that 75% of people prefer to communicate in their native language. This is particularly true in industries where communication is a crucial factor, such as e-commerce, education, health, law, marketing, and much more.

Hence, if a company wants to ensure success in the global marketplace, it must translate its online content, websites, and documentation into various languages. All of this is possible with the help of language translation. Translation helps in breaking language barriers by spreading information, ideas, and knowledge effectively with people in different countries.

Let's have a look at the applications of language translation in the modern world.

1. Technical translation

Technical translation involves translating documents produced by technical writers, or any other content related to scientific and technological subjects. To avoid any errors, companies must take the help of professional translators who have the required expertise and knowledge of different technical terms, both in the source and target languages. In doing so, this reduces any misunderstanding with respect to the documents and the subsequent effects associated with them.

2. Language translation in healthcare

Translation experts should be medical and science graduates. Moreover, they should be well-versed with medical concepts and terminologies. The most vital medical documents that need translation include discharge instructions, complaint forms, intake forms that have clinical consequences, and informed consent documents.

3. Translation and travel & tourism industry

In the travel and tourism sector, language translation is required for a variety of things. For example, the translation of travel documents, brochures, and terms and conditions documents is crucial for interacting with people of different regions, a translator who is fluent in both the original and the target language.

CHAPTER 3

LITERATURE REVIEW

3.1 Translation Concept:

Translation has been defined in many ways by different writers in the field, depending on how they view language and translation. According to Wills in Choliludin (2007: 3), translation is a procedure which leads from a written source language text to an optimally equivalent target language text and requires the syntactic, semantic, stylistic and text pragmatic comprehension by the translator of the original text. Besides, Nida and Taber (1982: 12) say that translating consists in reproducing in the receptor language the closest natural equivalent of the source language message, firstly in terms of meaning and secondly in terms of style. Both definitions above imply that translation involves two languages: the source language (SL) and the target or receptor language (TL or RL), and that an act of translating is an act of reproducing the meaning of the SL text into that of the TL text. Catford (1965: 20) states that translation may be defined as the replacement of textual material in one language (SL) by equivalent textual material in another language (TL). Similar definition is also mentioned by Larson (1984: 3). He says that translation consists of translating the meaning of the source language into the receptor language. This is done by going from the form of the first language to the form of a second language by way of semantic structure. It is meaning which is being transferred and must be held constant. Only the form changes.

From the notions above it can be concluded that translating includes the act of transferring a message from the source text to the target text. The aim of translation is to find the equivalent meaning of the source language expression in the target language. Thus, meaning is important in translation and it must be held constant. Furthermore, translating a literary work into another language is creating a new literary work in another language. A translation novel is a novel that contains a different language from the original text but carrying the spirit of the original text. It also arouses the same response to the readers between the two languages.

3.1.1 Types of Translation

Catford (1965: 21-25) makes categories of translation in terms of extent, levels, and ranks. Based on the extent, he classifies translation into full and partial translation. On the levels of translation, there are total and restricted translation and on the ranks there are rank bound and unbounded translation. In full translation, the entire text is submitted to the translation process, that is, every part of the source language text is replaced by the target language text material. In partial translation, some parts of the source language text are left untranslated. They are simply transferred to the target language text. Total translation means the replacement of SL grammar and lexis by equivalent TL grammar and lexis with consequential replacement of SL phonology or graphology by non equivalent TL

phonology or graphology. While restricted translation means the replacement of SL textual material by equivalent TL textual 9 material at only one level, that is translation performed only at the phonological or at graphological level, or at only one of the two levels of grammar and lexis. Rank-bound translation is translation in which the selection of TL equivalents is deliberately confined to one rank or a few ranks in the hierarchy of grammatical units, usually at word or morpheme rank, that is, setting up word-to-word or morpheme-to-morpheme equivalence. In contrast with this, normal total translation in which equivalences shift freely up and down the rank scale is called unbounded translation. Based on the purpose of translation, Brislin (in Choliludin, 2007: 26-29) categorizes translation into these following types.

a. Pragmatic Translation: It refers to the translation of a message with an interest in accuracy of the information that was meant to be conveyed in the source language form. It is not concerned with other aspects of the original language version.

b. Aesthetic-poetic Translation: This refers to translation in which the translator takes into account the affect, emotion, and feelings of an original agnate version, the aesthetic form used by the original author, as well as any information in the message. The examples of this type are the translation of sonnet, rhyme, heroic couplet, dramatic dialogue, and novel.

c. Ethnographic Translation: The purpose of ethnographic translation is to explicate the cultural context of the source language and target language versions. Translators have to be sensitive to the way the words are used and must know how the words fits into cultures.

d. Linguistic Translation: This is concerned with equivalent meanings of the constituent morphemes of the source language and grammatical form. The example is the language in a computer program and machine translation. Brislin says that basically, based on the kinds of texts to be translated, there are two types of translation namely factual and literary translations. Factual translation refers to translating to convey information with precision, without involving the emotions or feelings of the translator but only based on the real facts such as translating scientific fields, reports, newspaper, etc.

Literary translation refers to the translation of art works. In this kind of translation, the translator involves his or her emotion or feeling and it tends to be subjective, for example the translation of poems, drama, novels, etc. According to Larson (1984: 15) translation is classified into two main types, namely form-based and meaning-based translation. Form-based translation attempts to follow the form of Source Language and is known as literal translation, while meaning-based translation makes every effort to communicate the meaning of the SL text in the natural forms of the receptor language.

Such translation is called idiomatic translation. 11 Larson (1984: 16) says that idiomatic translations use the natural forms of the receptor language both in the grammatical constructions and in the choices of lexical items. A truly idiomatic translation does not sound like a translation. It sounds like it was written originally in the receptor language. Therefore, a good translator will try to translate idiomatically.

3.1.2 Form and Meaning in Translation

Larson (1984: 3) states that translation is basically a change of form. These forms are referred to as the surface structure of a language. It is the structural part of language which is actually seen in print or heard in speech. Baker (1992: 24) says that the form of the source language in translation is replaced by the equivalent lexical item (form) of the receptor language. However, there is often no equivalent in the target language for a particular form in the source text. According to Larson (1984: 3), translation is done by going from the form of the first language to the form of the second language by way of semantic structure. When a translator makes a translation, it means that he or she transfers the meaning of the source text. What is necessary to consider is that the meaning must be maintained constantly or, in other words, when the change of form occurs, the meaning must be maintained. It is the characteristic of a language that the same meaning component will occur in several surface structure lexical items (forms). A (Source) (Analysis) X B (Receptor) (Restructuring) Y (Transfer) 15 In the translation process, the first thing to do is understand the total meaning of the source text.

There are three types of "meaning" that can be determined in the analysis of meaning of the source text (Nida and Taber, 1982: 34), namely

(1) grammatical meaning,
(2) referential meaning, and
(3) connotative meaning.

In grammatical meaning, when one thinks of meaning, it is almost inevitably in terms of words or idioms. Generally grammar is taken for granted since it seems to be merely a set of arbitrary rules about arrangement, rules that must be followed if one wants to understand, but not rules themselves that seem to have any meaning. Referential meaning refers to words as symbols which refer to objects, events, abstracts, and relations.

Connotative meaning refers to how the users of the language react, whether positively or negatively, to the words and their combination. Translation has been performed as a process which begins with the source text, then the meaning of the text is analyzed, discovered, transferred, and re-expressed in the receptor language.

In actual practice, however, the translator moves back and forward from the source text to the receptor text. Sometimes he or she will analyze the source text in order to find the meaning, then restructure this meaning in the receptor language, and move back once again to look at the source text. In translation, the translators should know the types of meanings. By knowing what meaning they should produce, the messages of the source text can be transferred well. Then, the well-transferred meaning will be easier to understand for the readers.

3.1.3 Translation Strategies

The term strategy is often said to be similar to the term technique. In some ways it can be called similar because some experts use these terms with the same purpose. For example, Mona Baker says that she proposes some strategies to translate idiomatic expressions, whereas Andrejs Veisberg proposes some techniques to translate idiomatic expressions. Both expressions aim at the same point.

According to Oxford Advanced Learner's Dictionary, technique is a method of doing or performing something whereas strategy is a plan to accomplish a specific goal. This research will use the term strategy related to Mona Baker's theory of strategies to translate idiomatic translation. Mona Baker's view of translation strategies are applied when a translation difficulty occurs and the translator wishes to solve the problem and produce a good translation. Thus, translation strategies are means which are considered to be the best in order to reach the goals.

Based on many experts in translation, there are many translation strategies to translate a text. Every translator uses different strategies to translate a text since different people may understand a word in different ways. Furthermore, there are kinds of expressions such as idioms and proverbs which are the products of culture. Idioms in one language probably have different forms in other languages. It may have a distinctive form but the same meaning.

The way in which an idiom can be translated into another language depends on many factors, such as the availability of an idiom with a similar meaning, the significance of the specific lexical items which constitute the idiom, and the appropriateness of using idiomatic language in a given register in the target language. Mona Baker (1992: 72) proposes some strategies that can be used to translate idioms.

a. Using an idiom of similar meaning and form

This strategy involves using an idiom in the target language which conveys roughly the same meaning as that of the source-language idiom and, in addition, consists of equivalent

lexical items (Baker, 1992: 72). The example is given as follows. SL: In a little while, however, she again heard a little pattering of footsteps in the distance, and she looked up eagerly, half hoping that the Mouse had changed his mind, and was coming back to finish his story. TL: Beberapa saat kemudian, sekali lagi dia mendengar suara langkah kaki di kejauhan. Alice menatap dengan penuh semangat, berharap si Tikus berubah pikiran dan kembali untuk menyelesaikan ceritanya.

The English idiomatic expression change his mind is translated into Bahasa Indonesia idiomatic expression berubah pikiran. According to the Dictionary of American Idioms and Phrasal Verbs, changing one's mind means to alter one's decision or opinion. The word change has similar meaning with berubah and mind has similar meaning with pikiran. According to the context 19 of the sentence, the word his is optional. In conclusion, both English and Bahasa Indonesia idiomatic expressions refer to the same meaning and consist of similar lexical items.

b. Using an idiom of similar meaning but dissimilar form

It is often possible to find an idiom or fixed expression in the target language which has a meaning similar to that of the source idiom or expression, but which consists of different lexical items (Baker, 1992: 74). This strategy uses different lexical items to express more or less the same idea. The example is presented below. SL: It would twist itself round and look up in her face, with such a puzzled expression that she could not help bursting out laughing. TL: Tapi, burung itu memutar dirinya dan menatap wajah Alice dengan sangat bingung sehingga Alice tidak dapat menahan diri untuk tertawa. According to Dictionary of American Idioms and Phrasal Verbs , the idiom could not help (doing something) means could not prevent or avoid on doing something. It means could not restrain, the word restrain refers to prevent oneself from doing something. Thus, idiomatically could not prevent means tidak dapat menahan diri. Therefore, both expressions in the source language and its translation in the target language refer to the same meaning. In terms of form, both expressions cannot be said as equivalent. If the idiomatic expression could not help translated literally, it will become tidak dapat menolong and it will be confusing to the reader.

c. Translation by paraphrase

This is by far the most common way of translating idioms when an equivalent cannot be found in the target language or when it seems inappropriate to use idiomatic language in the target text because of differences in stylistic preferences of the source and target language (Baker, 1992: 74). Below is the example of the paraphrase strategy. SL:

They all sat down at once, in a large ring with the Mouse in the middle. TL: Seketika anggota rapat itu duduk dalam lingkaran besar, sementara si Tikus berada di tengah-tengah. The English idiom at once is translated into seketika in the target language text. Since the translator cannot find the equivalent of the English idiom in the idiomatic form of the target language, the translator does not translate it into idiomatic expression. The idiom at once means immediately or at the same time, the word seketika means dengan serta merta. The idiomatic expression in the source language text is translated based on its context which is more acceptable and understandable.

d. Translation by omission

As with single words, an idiom may sometimes be omitted altogether in the target text. It is because it has no close equivalent in the target language, its meaning cannot be easily paraphrased, or for stylistic reasons (Baker, 1992: 77). The example is presented below. 21 SL: I shall have to ask them what the name of the country is, you know. TL: Tapi aku harus bertanya pada mereka nama negeri ini. It can be seen in the example above that you know is not realized in Bahasa Indonesia. According to the Dictionary of Idioms and Phrasal Verbs, the idiomatic expression you know is used to open a conversation or switch to a new topic. The translator applies the omission strategy by letting the idiom you know be not translated to get effectiveness and considers that the readers will easily understand the meaning of the idiom.

Since it is very difficult to translate idioms into idioms, then a translator may apply non idiomatic translation in order to maintain the meaning of the translated expressions in the target language. Moreover, he or she has a choice not to realize an idiom in the translation since it has no close match in the target language or its meaning cannot be easily paraphrased.

CHAPTER 4

SOFTWARE REQUIREMENT

4.1 Software's Versions :

1. Visual Studio Code (1.63)
2. Android Studio (4.2.2)
3. Windows OS (8/10/11)

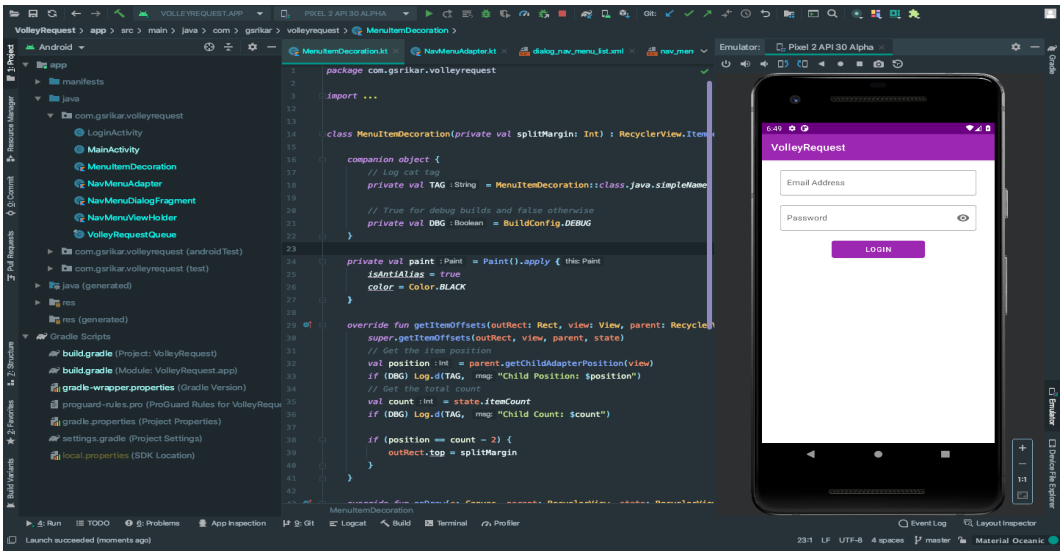

Fig 4.1: Android Studio Setup

4.2 Developer's Requirement :

1. Docker Image
2. Azure Cloud Services

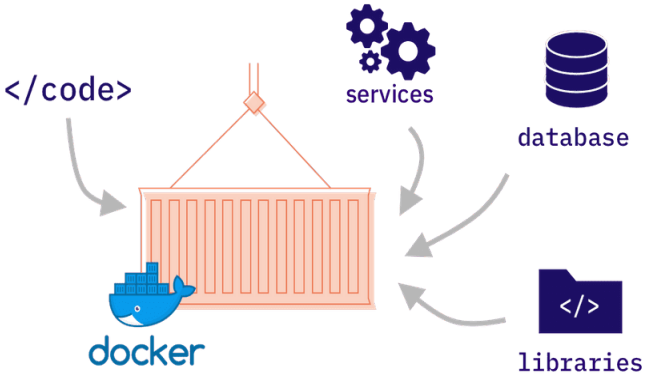

Fig 4.2: Docker Image Flowchart

CHAPTER 5

HARDWARE REQUIREMENT

5.1 Developers Requirement :

1. Keyboard
2. Mouse
3. Laptop
4. Smartphone
5. Stable Internet Connection

Fig 5.1 : Hardware Developer's Requirement

5.2 End User Requirement:

1. Smart phone (Android OS version 4.0 and higher)
2. Stable Internet Connection

CHAPTER 6

APPLICATION BUILD-UP

6.1 Azure Cloud Services :

Azure Cloud Services is an example of a platform as a service (PaaS). Like Azure App Service, this technology is designed to support applications that are scalable, reliable, and inexpensive to operate. In the same way that App Service is hosted on virtual machines (VMs), so too is Azure Cloud Services. However, you have more control over the VMs. You can install your own software on VMs that use Azure Cloud Services, and you can access them remotely

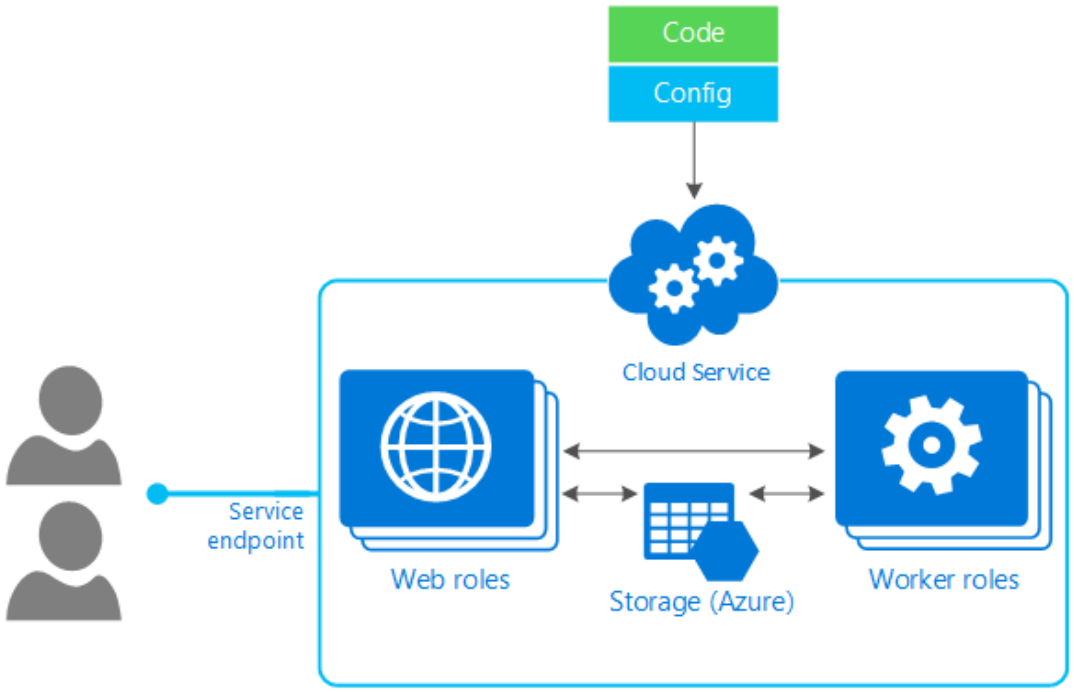

Fig 6.1 : Azure Architecture

More control also means less ease of use. Unless you need the additional control options, it's typically quicker and easier to get a web application up and running in the Web Apps feature of App Service compared to Azure Cloud Services.

There are two types of Azure Cloud Services roles. The only difference between the two is how your role is hosted on the VMs:

- Web role: Automatically deploys and hosts your app through IIS.
- Worker role: Does not use IIS, and runs your app standalone.

For example, a simple application might use just a single web role, serving a website. A more complex application might use a web role to handle incoming requests from users, and then pass those requests on to a worker role for processing. (This communication might use Azure Service Bus or Azure Queue storage.)

As the preceding figure suggests, all the VMs in a single application run in the same cloud service. Users access the application through a single public IP ad requests automatically load balanced across the application's VMs. The platform scales and deploys the VMs in an Azure Cloud Services application in a way that avoids a single point of hardware failure.

Even though applications run in VMs, it's important to understand that Azure Cloud Services provides PaaS, not infrastructure as a service (IaaS). Here's one way to think about it. With IaaS, such as Azure Virtual Machines, you first create and configure the environment your application runs in. Then you deploy your application into this environment. You're responsible for managing much of this world, by doing things such as deploying new patched versions of the operating system in each VM. In PaaS, by contrast, it's as if the environment already exists. All you have to do is deploy your application. Management of the platform it runs on, including deploying new versions of the operating system, is handled for you.

In addition to the services that Microsoft offers through the Azure portal, a number of third-party vendors also make software directly available through Azure. The cost billed for third-party applications varies widely but may involve paying a subscription fee for the application, plus a usage fee for the infrastructure used to host the application.

Microsoft provides five different customer support options for Azure:

- Basic
- Developer
- Standard
- Professional Direct
- Premier

These customer support plans vary in terms of scope and price. Basic support is available to all Azure accounts, but Microsoft charges a fee for the other support offerings. Developer support costs $29 per month, while Standard support costs $100 per month and Professional Direct support is $1000 per month. Microsoft does not disclose the pricing for Premier support.

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6.2 Kubernetes :

Kubernetes is a portable, extensible, open-source platform for managing containerized workloads and services, that facilitates both declarative configuration and automation. It has a large, rapidly growing ecosystem. Kubernetes services, support, and tools are widely available.

The name Kubernetes originates from Greek, meaning helmsman or pilot. K8s as an abbreviation results from counting the eight letters between the "K" and the "s". Google open-sourced the Kubernetes project in 2014. Kubernetes combines over 15 years of Google's experience running production workloads at scale with best-of-breed ideas and practices from the community.

Why do you need Kubernetes and what can it do?

Containers are a good way to bundle and run your applications. In a production environment, you need to manage the containers that run the applications and ensure that there is no downtime. For example, if a container goes down, another container needs to start. Wouldn't it be easier if this behavior was handled by a system?

That's how Kubernetes comes to the rescue! Kubernetes provides you with a framework to run distributed systems resiliently. It takes care of scaling and failover for your application, provides deployment patterns, and more. For example, Kubernetes can easily manage a canary deployment for your system.

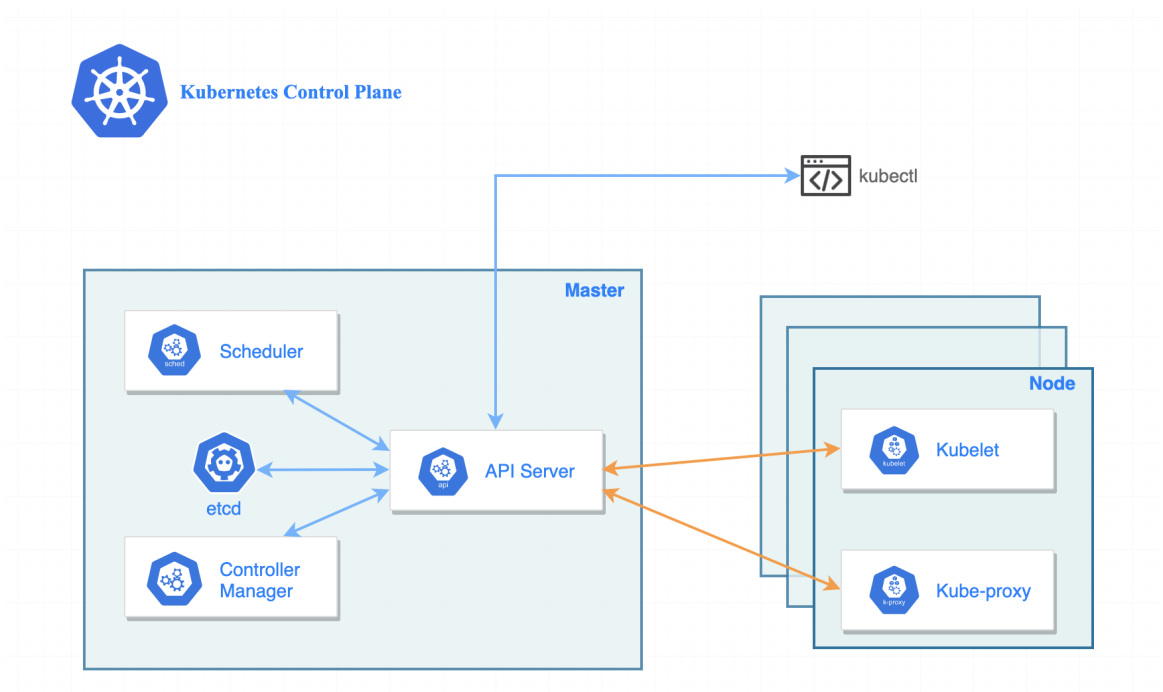

Fig 6.2 : Kubernetes Control Structure

6.2.1 How Kubernetes Works ?

Kubernetes works by managing a cluster of compute instances and scheduling containers to run on the cluster based on the available compute resources and the resource requirements of each container. Containers are run in logical groupings called pods and you can run and scale one or many containers together as a pod.

Kubernetes control plane software decides when and where to run your pods, manages traffic routing, and scales your pods based on utilization or other metrics that you define. Kubernetes automatically starts pods on your cluster based on their resource requirements and automatically restarts pods if they or the instances they are running on fail. Each pod is given an IP address and a single DNS name, which Kubernetes uses to connect your services with each other and external traffic.

6.2.2 Why Use Kubernetes ?

Because Kubernetes is an open-source project, you can use it to run your containerized applications anywhere without needing to change your operational tooling. Kubernetes is maintained by a large community of volunteers and is always improving. Additionally, many other open source projects and vendors build and maintain Kubernetes-compatible software that you can use to improve and extend your application architecture.

6.3 NodeJS:

As an asynchronous event-driven JavaScript runtime, Node.js is designed to build scalable network applications. In the following "hello world" example, many connections can be handled concurrently. Upon each connection, the callback is fired, but if there is no work to be done, Node.js will sleep.

Node.js is similar in design to, and influenced by, systems like Ruby's Event Machine and Python's Twisted. Node.js takes the event model a bit further. It presents an event loop as a runtime construct instead of as a library. In other systems, there is always a blocking call to start the event-loop. Typically, behavior is defined through callbacks at the beginning of a script, and at the end a server is started through a blocking call like EventMachine::run(). In Node.js, there is no such start-the-event-loop call. Node.js simply enters the event loop after executing the input script. Node.js exits the event loop when there are no more callbacks to perform. This behavior is like browser JavaScript — the event loop is hidden from the user.

HTTP is a first-class citizen in Node.js, designed with streaming and low latency in mind. This makes Node.js well suited for the foundation of a web library or framework.

Node.js being designed without threads doesn't mean you can't take advantage of multiple cores in your environment. Child processes can be spawned by using our child_process.fork() API, and are designed to be easy to communicate with. Built upon that same interface is the cluster module, which allows you to share sockets between processes to enable load balancing over your cores.

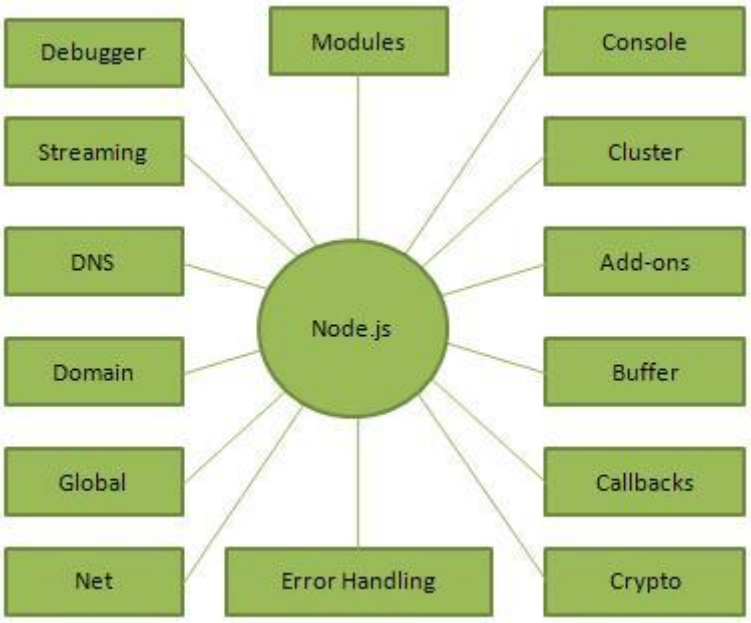

Fig 6.3 : Node JS Modules

Node.js is built against modern versions of V8. By keeping up-to-date with the latest releases of this engine, we ensure new features from the JavaScript ECMA-262 specification are brought to Node.js developers in a timely manner, as well as continued performance and stability improvements.

All ECMAScript 2015 (ES6) features are split into three groups for shipping, staged, and in progress features:

- All shipping features, which V8 considers stable, are turned on by default on Node.js and do NOT require any kind of runtime flag.
- Staged features, which are almost-completed features that are not considered stable by the V8 team, require a runtime flag: `--harmony`.
- In progress features can be activated individually by their respective harmony flag, although this is highly discouraged unless for testing purposes. Note: these flags are exposed by V8 and will potentially change without any deprecation notice.

New features are constantly being added to the V8 engine. Generally speaking, expect them to land on a future Node.js release, although timing is unknown.

You may list all the *in progress* features available on each Node.js release by grepping through the `--v8-options` argument. Please note that these are incomplete and possibly broken features of V8, so use them at your own risk.

6.4 Application Programming Interface (API):

The term API is an acronym, and it stands for “Application Programming Interface.”

Think of an API like a menu in a restaurant. The menu provides a list of dishes you can order, along with a description of each dish. When you specify what menu items you want, the restaurant’s kitchen does the work and provides you with some finished dishes. You don’t know exactly how the restaurant prepares that food, and you don’t really need to.

Similarly, an API lists a bunch of operations that developers can use, along with a description of what they do. The developer doesn’t necessarily need to know how, for example, an operating system builds and presents a “Save As” dialog box. They just need to know that it’s available for use in their app.

This isn’t a perfect metaphor, as developers may have to provide their own data to the API to get the results, so perhaps it’s more like a fancy restaurant where you can provide some of your own ingredients the kitchen will work with.

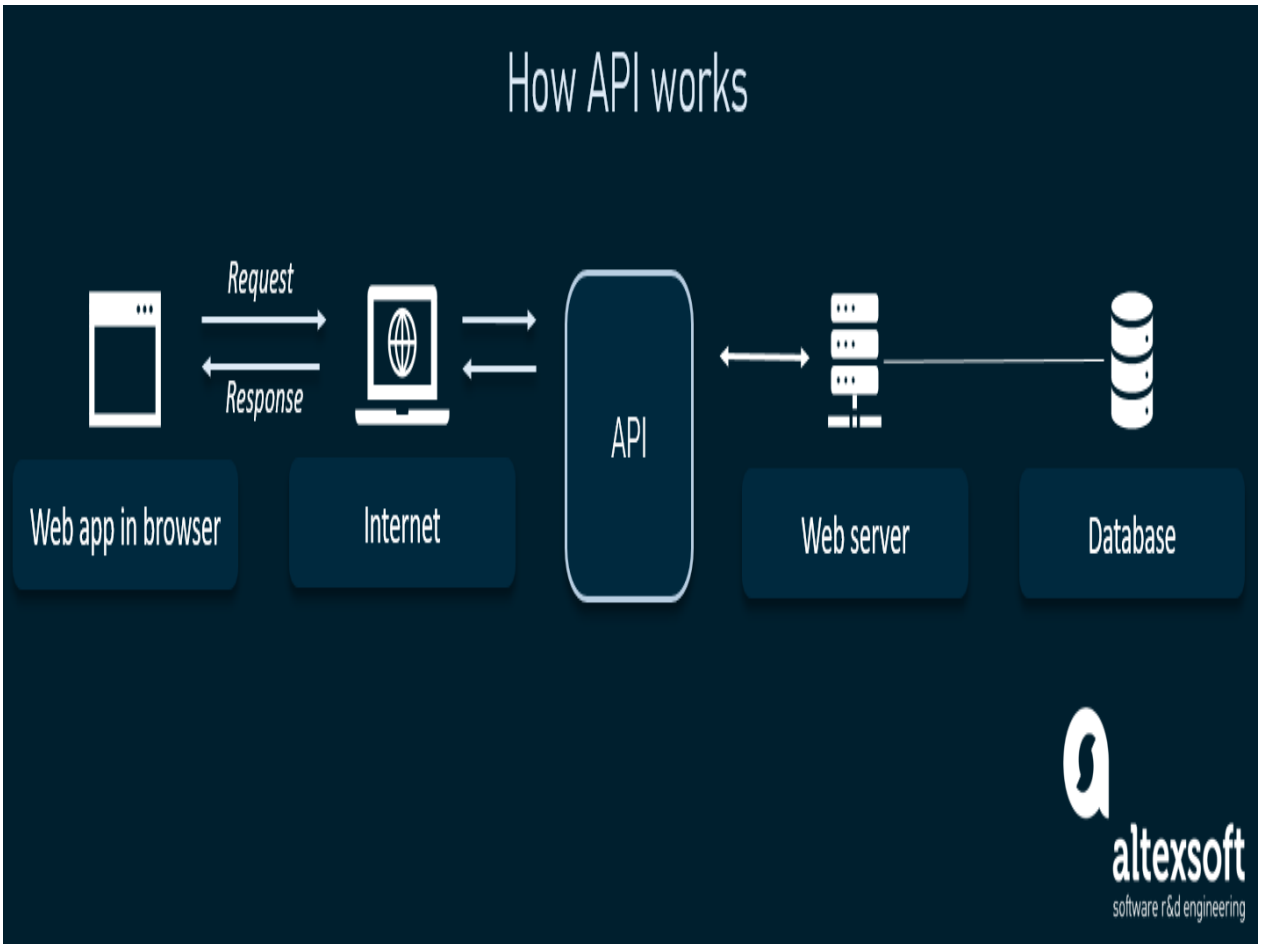

Fig 6.4 : API Workflow

The interface to a software library is one type of API. The API describes and prescribes the "expected behavior" (a specification) while the library is an "actual implementation" of this set of rules.

A single API can have multiple implementations (or none, being abstract) in the form of different libraries that share the same programming interface.

The separation of the API from its implementation can allow programs written in one language to use a library written in another. For example, because Scala and Java compile to compatible bytecode, Scala developers can take advantage of any Java API.[14]

API use can vary depending on the type of programming language involved. An API for a procedural language such as Lua could consist primarily of basic routines to execute code, manipulate data or handle errors while an API for an object-oriented language, such as Java, would provide a specification of classes and its class methods.[15][16] Hyrum's law [17] states that "With a sufficient number of users of an API, it does not matter what you promise in the contract: all observable behaviors of your system will be depended on by somebody." Meanwhile, several studies show that most applications that use an API tend to use a small part of the API.[18] API use actually varies depending on the number of users, as well as on the popularity of the API.[19]

Language binding are also APIs. By mapping the features and capabilities of one language to an interface implemented in another language, a language binding allows a library or service written in one language to be used when developing in another language.[20]

Tools such as SWIG and F2PY, a Fortran-to-Python interface generator, facilitate the creation of such interfaces.[21]

An API can also be related to a software framework: a framework can be based on several libraries implementing several APIs, but unlike the normal use of an API, the access to the behavior built into the framework is mediated by extending its content with new classes plugged into the framework itself.

Moreover, the overall program flow of control can be out of the control of the caller and in the framework's hands by inversion of control or a similar mechanism

6.4.1 HTTP GET :

GET requests are the most common and widely used methods in APIs and websites. Simply put, the GET method is used to **retrieve data from a server at the specified resource**. For example, say you have an API with a /users endpoint. Making a GET request to that endpoint should return a list of all available users.

Since a GET request is only requesting data and not modifying any resources, it's considered a safe and idempotent method.

When you're creating tests for an API, the GET method will likely be the most frequent type of request made by consumers of the service, so it's important to **check every known endpoint with a GET request**.

At a basic level, these things should be validated:

- Check that a valid GET request returns a 200 status code.
- Ensure that a GET request to a specific resource returns the correct data. For example, GET /users returns a list of users.

GET is often the **default method in HTTP clients**, so creating tests for these resources should be simple with any tool you choose.

Advantages:

- Since the data sent by the GET method are displayed in the URL, it is possible to bookmark the page with specific query string values.
- GET requests can be cached and GET requests to remain in the browser history.
- GET requests can be bookmarked.

Disadvantages:

- The GET method is not suitable for passing sensitive information such as the username and password, because these are fully visible in the URL query string as well as potentially stored in the client browser's memory as a visited page.
- Because the GET method assigns data to a server environment variable, the length of the URL is limited. So, there is a limitation for the total data to be sent.

6.4.2 HTTP POST :

In computing, **POST** is a request method supported by HTTP used by the World Wide Web. By design, the POST request method requests that a web server accept the data enclosed in the body of the request message, most likely for storing it.[1] It is often used when uploading a file or when submitting a completed web form.

In contrast, the HTTP GET request method retrieves information from the server. As part of a GET request, some data can be passed within the URL's query string, specifying (for example) search terms, date ranges, or other information that defines the query.

As part of a POST request, an arbitrary amount of data of any type can be sent to the server in the body of the request message. A header field in the POST request usually indicates the message body's Internet media type.

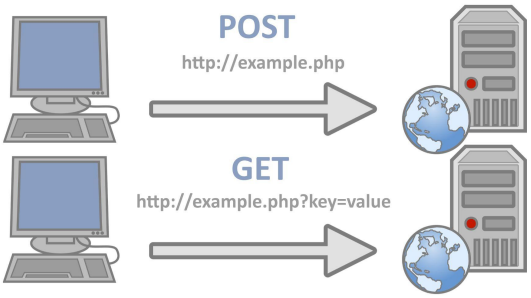

Fig 6.4.1: HTTP GET & POST Method

Advantages:

- It is more secure than GET because user-entered information is never visible in the URL query string or in the server logs.
- There is a much larger limit on the amount of data that can be passed and one can send text data as well as binary data (uploading a file) using POST.

Disadvantages:

- Since the data sent by the POST method is not visible in the URL, so it is not possible to bookmark the page with a specific query.
- POST requests are never cached
- POST requests do not remain in the browser history.

6.5 Frontend Details :

- The frontend has been developed in JAVA.
- In order to integrate with the backend service we have used the Volley dependency library.

More about Volley can be found here.

- Github link: https://github.com/Surakshamandhan/Localizer-f

IDE Used	Android Studio
Languages Used	Java, XML

Table 6.5 - Frontend Details

6.6 Backend Details :

To integrate with a translation engine we used Microsoft Translation engine.

Steps to integrate with the Microsoft Cognitive Services can be found here.

- We chose node.js for developing the backend as it is quick to develop and provides us with asynchronous functionalities.
- We used Express.js to expose the REST API's.
- We have exposed two API's:

a. API 1:

- Path - /languages
- Content-Type – "application/json"
- Method - Http GET
- *Response – Map of all supported languages.*

b. API 2:

- Path - /translate
- Content-Type – "application/json"
- Method – Http POST
- Request Body -

{ "text" : <text to translate>, "toLang": <language of translation> }

- *Response – "The translated text in the requested language".*

- The code has been dockerized and the image can be found here
- The container has been deployed in Azure Kubernetes Service.
- Github link: https://github.com/Suraksha-mandhan/Localizer

TM technology is available in specialized translation software packages (e.g., SDL Trados Studio, MemoQ, Wordfast) that perform a variety of tasks designed for professional translators and project managers, including file format conversion, and terminology management functions. Most TM software today also allows the user to connect to MT engines, which can feed the automatic translation to them for post-editing.

Another widely available tool is specialized terminology software. In its simplest form, this software maintains a database of term correspondences between two languages (sometimes referred to as a termbase) which can be queried on demand or automatically from within TM software, or used as a standalone tool. Terminology management should be considered an integral part of the translation process, independently of how it is handled and by whom. For additional information see section 4.0.0., Supporting the Translation Process.

Knowing whether the translators or translation company you work with utilize these tools can be important. For example, if the text you wish to translate contains often-repeated sentences, you may be able to benefit from the use of TM in the form of lower costs, since you would pay only once for the translation of identical segments appearing multiple times in the text. TM software can also provide savings when updating previously translated text: an existing translation memory can speed up the update process by quickly retrieving unchanged segments and flagging new and changed segments, thus reducing the amount of content that needs to be translated for the update.

IDE Used	**VS Code**
Languages Used	**Node JS, Express JS, YAML**
Build & Deployment	**Docker Image, Azure Kubernetes Service**

Table 6.6 - Backend Details

6.7 Workflow Diagram :

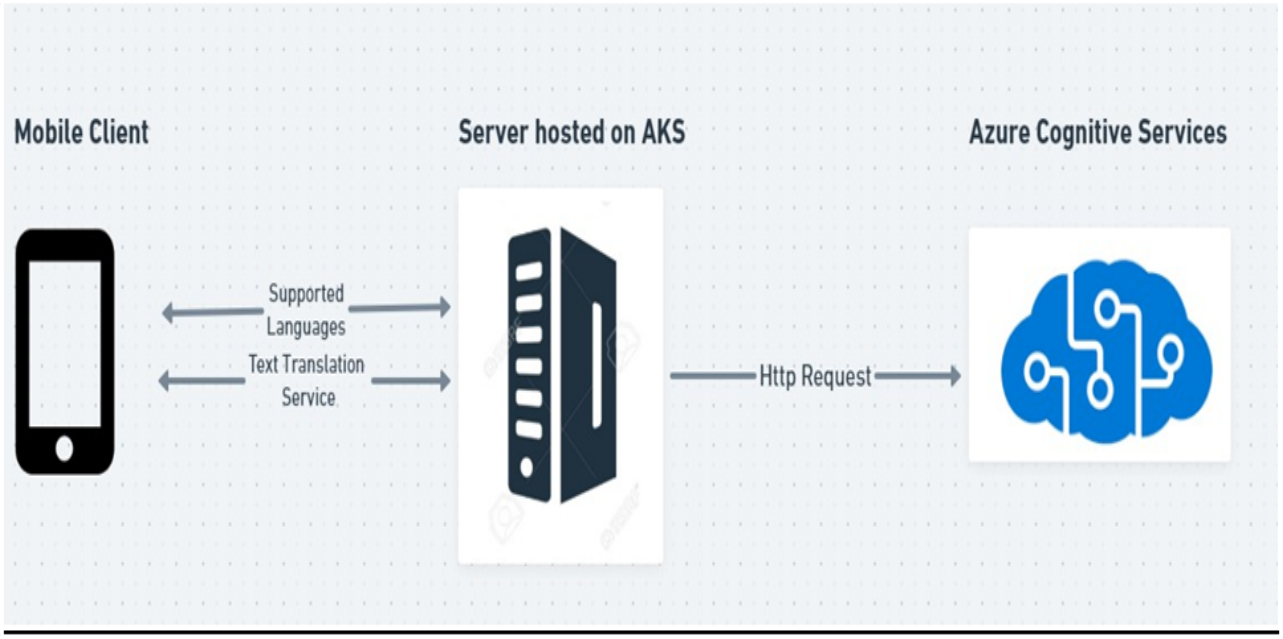

Fig 6.7 : WorkFlow Diagram

6.8 Data flow Diagram :

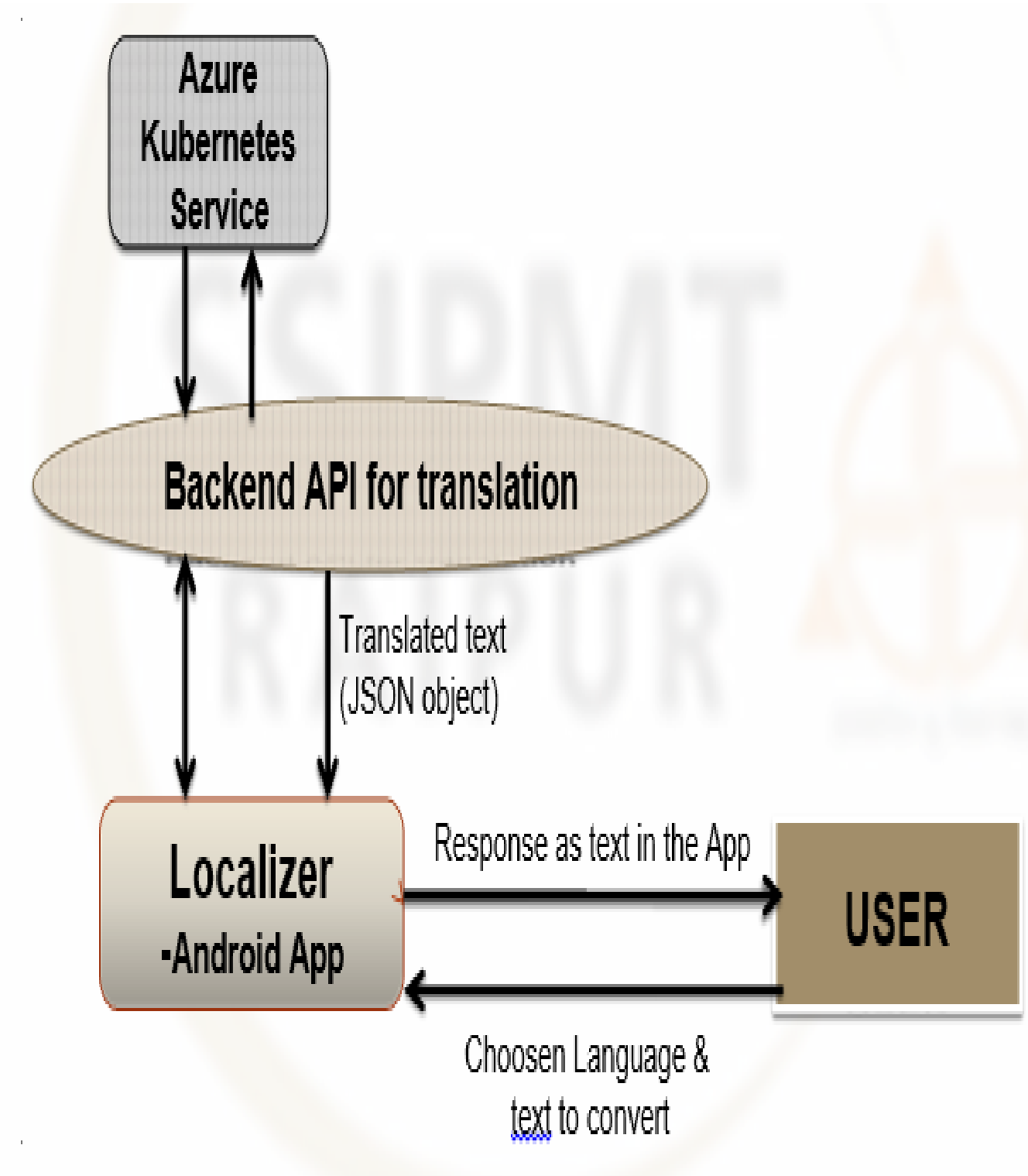

Fig 6.8 : Data Flow Diagram

CHAPTER 7

SNAPSHOTS

7.1 Application UI

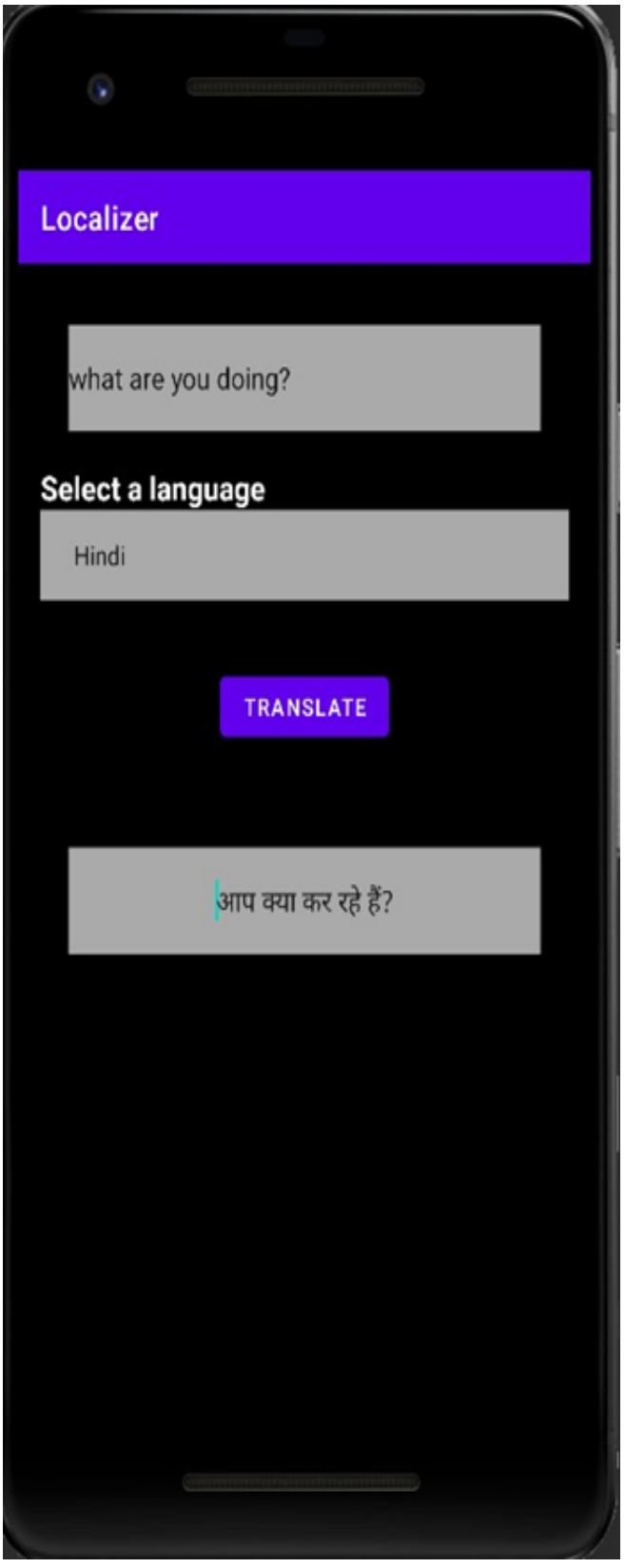

Fig 7.1 : Application UI Snapshot

7.2 Docker File Code

```
localizer > Dockerfile > ...
1   FROM node:16
2   # Create app directory
3   WORKDIR /usr/src/app
4   COPY package*.json ./
5   RUN npm install
6   # Bundle app source
7   COPY . .
8   EXPOSE 8080
9   CMD [ "node", "app-server.js" ]
```

Fig 7.2 Docker Image Code Snapshot

7.3 Application Server Code

```
const express = require('express')
const app = express()
const translator = require("./utils/translator.js")

app.use(express.json())
app.use(express.urlencoded({extended: false}))
//Endpoint to get all supported languages


app.get('/languages', (req, res) => {
    translator.supportedLangs((data) => {
        console.log(JSON.stringify(data, null, 4))
        res.send(data)
    })
})

app.post('/translate', (req, res) => {
    var body = req.body
    var text = body.text
    var toLanguage = body.toLang
    translator.translateFromEnglishToLang(text, toLanguage, (status, data) => {
        res.status(status)
        res.send(data)
    })
})
// Creating a server to listen to port 8080
//translator.translateFromEnglishToLang("How are you?", 'bn')

var server = app.listen(8080, () => {
    var host = server.address().address
    var port = server.address().port
    console.log(`REST API listening on ${host}:${port}`)
})
```

Fig 7.3 : Application Server Code Snapshot

7.4 Frontend Code

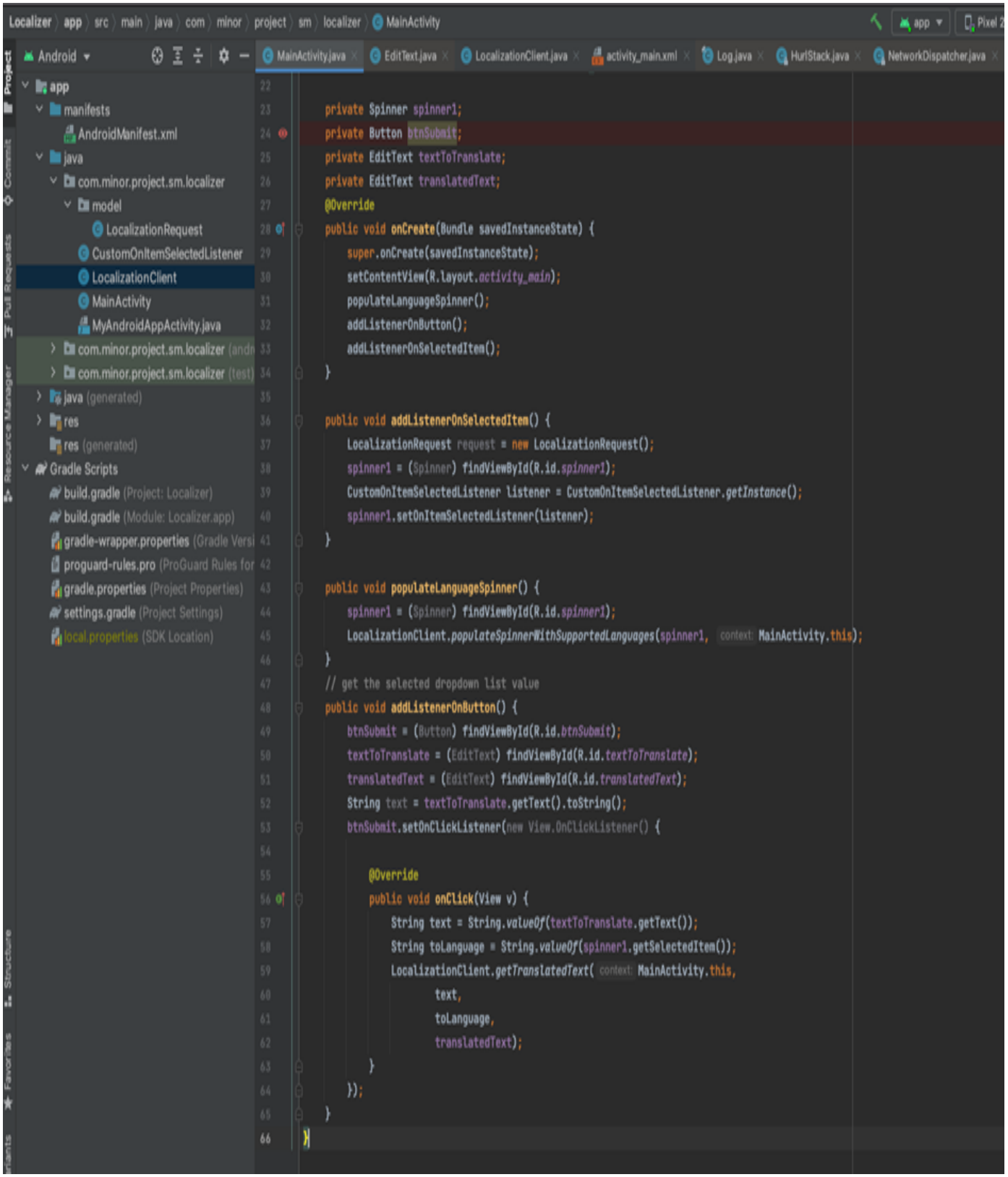

Fig 7.4 : Frontend Code Snapshot

CHAPTER 8

RESULTS & ANALYSIS

8.1 Experiment :

Background What are we to believe? Is translation a useful component of language teaching and testing, or is it not? As we have seen, opinions differ widely, and we still lack necessary evidence to answer this question. For the time being, we must therefore be content to conclude that the issue is undecided: translation may have some value as a teaching tool and it is probably rather unreliable as a testing tool, except perhaps as a test of L2 comprehension (cf. Buck's 1992 study). Personally I am inclined to agree with this conclusion. As far as trans- la tion as a teaching tool is concerned, I strongly believe that this may indeed be quite valuable, especially if the grammar-translation type of approach is supplemented (if not replaced) by a functional-com mu ni ca tive one, using for instance Nord's (1997) version of the skopos theory as a conceptual and analytical framework (as suggested in Schjoldager 2002).

In this way, the negative aspects of translation, for instance enhanced L1 interference, may be unbalanced by its positive aspects, especially the fact that translation is a controlled writing task forcing students to venture into new areas of L2. As far as translation as a testing tool is concerned, I am equally certain that it cannot be a reliable tool. I can see translation as a test of translation skills, but I cannot see it as an efficient test of general L2 proficiency. First of all, translation is bound to require more than is required for a monolingual L2 production task. Klein-Braley (1987) puts it like this about her own data: "[..] the translation tests measure the construct less adequately than the other, far more economical, test procedures, and there is good evidence for suspecting that they are two-dimensional, measuring other skills, probably translation skills, in addition to gen er al language pro fi cien cy."

(Klein-Braley 1987: 129) (For some interesting papers on how to define, develop and assess translation competence, see for instance Schäffner & Adab (eds) 2000.) Secondly, and this seems to be implicit in most criticism of translation for language purposes, the enhanced risk of L1 interference may possibly lead students to make more and other errors than they might otherwise commit. In view of the general lack of evidence within the field, I decided to concentrate on one interesting factor, namely that of enhanced L1 interference. By means of a simple comparative analysis of errors occurring in L2 translations and picture verbalizations in L2, the aim of my in ves ti ga tion is to answer these research questions: Do learners who translate commit more and other errors than learners who write comparable picture verbalizations? If they do, may this be due to enhanced L1 interference?

8.2 Assumptions :

As already mentioned, I assume that learners who translate into L2 may commit errors that are caused by an enhanced influence of L1 in ter fer ence in translation. There are at least two reasons for this: (1) Learners who translate from an L1 text are led to rely on processing via L1, and (2) learners tend to be 'hypnotized' by the source text (ST) wording, which prevents them from making full use of their L2 mastery (Larsen 1990: 97). (See also Wills (1982: 207), who makes a similar point about L1 translation.) I shall refer to errors that are deemed to be the result of an enhanced influence of L1 interference in translation as translation induced errors. On this basis, I chose to compare translations into English (L2) with picture verbalizations in English. I assume that picture ver bal i za tion and translation are sufficiently comparable because both are controlled tasks forcing subjects to express a given series of ideas. The comparability of the two tasks is further enhanced by the fact that the ST of my in ves - ti ga tion is itself a verbalization of the pictures in question - or, rather, a synthesized version of four native-speaker verbalizations, as explained below. On the other hand, it is also assumed that picture verbalization is sufficiently different from translation because it does not enhance L1 in ter fer ence: (1) Learners who do a picture verbalization are not led to rely on processing via L1, and (2) there is no verbal 'hypnosis' in picture verbalization. 6. Procedure First I had to find some suitable pictures. These should present a series of ideas that could be verbalized, and the material should be sufficient for me to devise a plausible and coherent ST. Various comic strips, which have been used in other investigations, especially within psycholinguistics, did not quite fit my requirements – mainly because they do not offer enough verbal material. After a rather long search, I found some large coloured pictures by Pia Thavlov (1996), in a charming children's book about a family outing. Thavlov's pictures were ideal for my purpose, for two reasons: (1) the story was told exclusively by means of pictures, and (2) each picture offered many details about the family's various activities, which could be verbalized into a coherent text.

Then a Danish ST (426 words) was constructed on the basis of four native-speaker verbalizations. After some experimentation in a pilot study, the data collection could begin (in the autumn of 2000). For various reasons of research methodology and manage a bil i ty, subjects did either a translation into English (L2) or a picture verbalization in English. Both groups were given a maximum time limit, 75 minutes and 65 minutes respectively, so as to enhance the degree of comparability between the two tasks. To make the assignment as plausible as possible, subjects were structured to pretend translating/writing a story for a children's programme on the radio, and, to rule out external factors, I made my subjects work without dictionaries in an exam-like situation. Admittedly, most students were not used to being given a brief5 like this for a translation assignment and none of them had been trained to work without dictionaries, but I have no way of assessing the possible impact of this. (For more details about the background and procedure of this in ves ti ga tion, see Schjoldager forthcoming.)

8.3 Result :

Before I mention some preliminary results, I should perhaps point out that some (but not all) picture verbalizations differ somewhat in length and contents from the translations, as a few students who did picture verbalizations seem to have written more personalized texts, adding for instance some imaginative details. However, as the initial analysis involves no direct comparison between the target texts (TTs), the relative comparability between the two kinds of texts will not be discussed further at this stage. Also, it is important to note that the analysis below is based on the occurrence of errors of language, as opposed to translation errors, which would involve a comparison with the ST or pictures. Finally, though at some later stage I intend to employ a panel of colleagues to help me assess the TTs, the analysis below comprises my own tentative marking of errors.

1) Are there more errors in the translations?

Yes. I found more errors in the translations than in the picture verbalizations

2) Is this overrepresentation of errors translation-induced?

Maybe. Apart from the above-mentioned difference in absolute numbers, so far I have found no evidence that the two tasks produce significantly different terms. However, though these are very prelim i nary results, I would like to mention that two categories of errors seem to be more prevalent in the translations, especially in those by the secondary-level students, namely – what I refer to as – non-translation and unEnglish

CHAPTER 9

FUNCTIONALITY

9.1 Functionality Provided by Translation

The proposed Android Text translation is based on a double objective:

(i) Word Transmission
(ii) Script Transfer Mark.

For a mobile translator, text libraries of different languages were built which includes the most frequently used terms in conversations in daily life. The user is asked to enter the text in the android code and click on the language-named button to convert to the text production. Figure demonstrates the system architecture of the mobile translator. This shows how the system proposed will function.

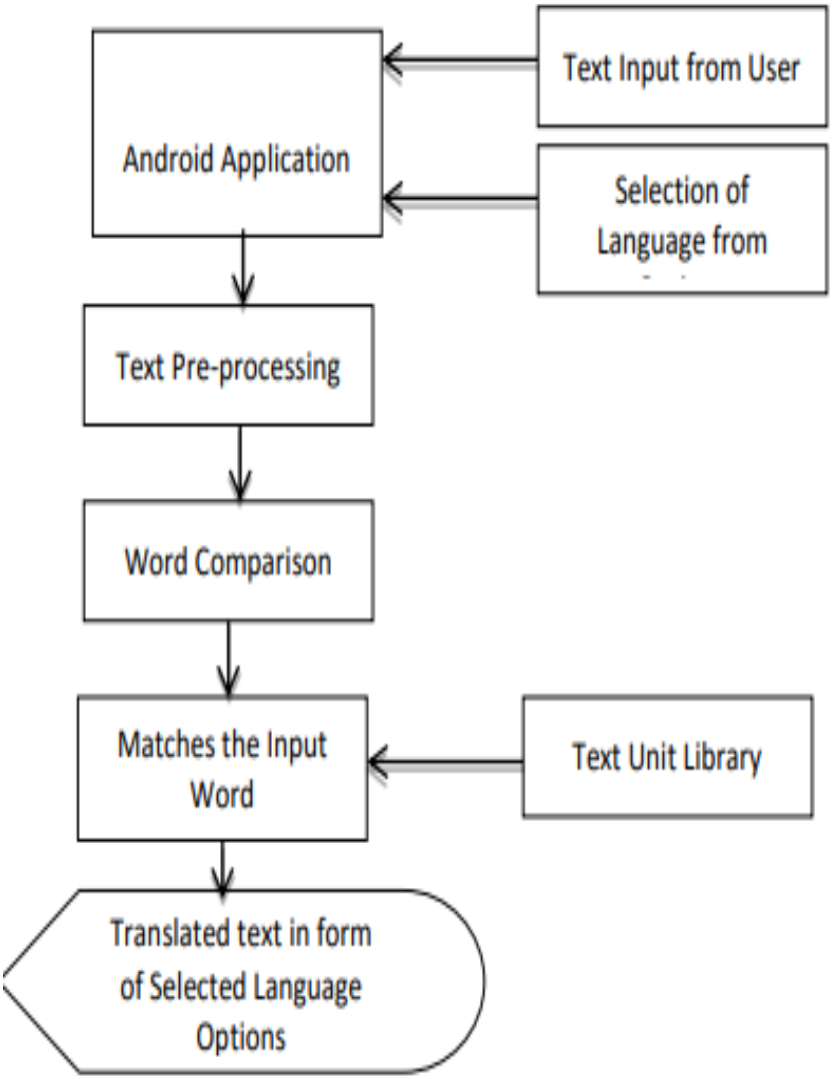

Fig 9.1 : Translation System Architecture

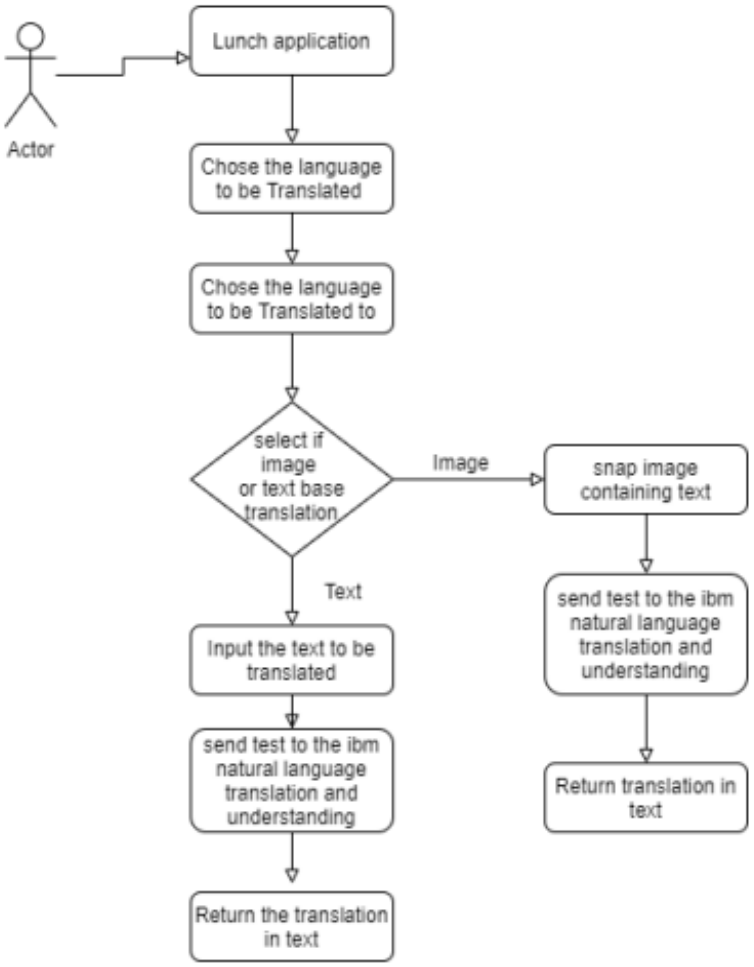

Fig 9.1.1 : Translation Flow Diagram

In developing this android application which can translate the most used languages in the world (i.e., English, Spanish, French, Hindi, Arabic, and Chinese) to any selected languages, the android application will be using the IBM Watson Language translator, an API that uses machine learning and AI. IBM Watson employs rule-based AI and a broad range of other mechanisms (e.g., information retrieval systems) and the latest Neural network AI [60]. In Theory, the application was created using Apache Cordova and Node.js application platform operating on IBM Cloud Kubernetes software that uses Tesseract OCR to identify text in pictures, Watson Language Converter to interpret the approved text, and Watson Natural Language Comprehension to extract sentiment, the meaning of the book.

CHAPTER 10

LIMITATIONS & FUTURE IMPROVEMENTS

10.1 Limitations:

Every emerging technology has some Limitations. The application only translates some commonly used languages. In future, it is fervently hoped that the translation can be enhanced to many other languages. However, the application will only be installed according to the needs of the tourists as it will be taking up a lot of memory of the mobile phones if they install all the languages. In order to view images and text, a large mobile phone screen is, of course, preferable. It is true that mobile phone makers have made their screens larger and larger. However, obviously it cannot be too large or mobile phones would not be portable or convenient. Resolution is another problem. Most mobile phones' image resolution cannot compete with computers whose resolutions are usually 800 x 600 or 1024 x 768 pixels.

10.2 Future Improvements:

The future of content and digital translation is certainly among human language translators of target languages. Statistical machine translation does not bring the emotions and connectivity of words as compared to human translators. Interlingual machine translation is an objective reality that is now not in demand.

Several key components are simply not attainable for these automated and statistical machine language translation. Statistical Machine translation software can only accomplish so much compared to the endless possibilities the human translator can do.

This gives businesses a higher level of confidence in human translators because the localization focus of the translated content becomes more appealing, engaging, and truly comprehensible for a target market in a global perspective. Rule-based translation with deep approach in-depth knowledge is required to do the translation good. The quality of machine translation and google translate is very different from a professional translator.

Unlike machine translation tools, translators rely on syntax, grammar, spelling, and sentence flow. They adapt the quality according to the client's requirements and criteria (read, the best translation). A translator polishes their text like a carpenter polishes their piece. In other words, the evolution of languages and technology does not jeopardize their profession... Quite the contrary!

Many are wondering what the future holds for a thousand-year-old profession that is said to be condemned by the progress of artificial intelligence. After producing incomprehensible, even ridiculous results for a long time, machine translation has made dazzling progress in recent years.

The future of translation is in the cloud. Many language services providers are still hesitant when it comes to SaaS and web-based technology. But, the times when you could keep all your information safe on your servers are long gone.

It’s time to embrace file sharing and cloud-based technology. These tools allow you to communicate faster, improve workflows, and protect your documents from cyber attacks.

Working on the web is going to be the new ‘normal’ in the industry. Your translators from any part of the world will access the documents easier, in a safe environment, with no need to download data in personal computers that are vulnerable and easy to break through to access sensitive data.

CHAPTER 11

Conclusion

11.1 Conclusion:

Smartphones are recognised in real life today as the most widely used mobile devices. Since smartphone-integrated hardware can perform far more functions than conventional phones, smartphones are no longer just a contact unit, but rather a powerful computer unit capable of taking images, recording videos, browsing the internet, etc. With the growth of technologies, such tools can be used to perform text identification and conversion. The developed application can translate from a text to text language and image to text translation on the most used languages in the world (i.e., English, Spanish, French, Hindi, Arabic, and Chinese) to any selected languages. The application can be used to take pictures of road signs that contain text and convert text on the photographs from a foreign language into the language of the users' choice. The application performs the translation within 47 seconds and 1.25 minutes for an image to text translation, which is relatively fast, the memory used is deficient compared with other applications on android phone. The accuracy of the translation of the application is also very encouraging, with 99% accuracy. Due to a larger screen and a higher number of background processes, the application energy consumption is still deficient compared to other applications on the phone. For further research, the application should include text to speech, speech to text, and even speech to speech translation, which will help visually impaired people.

I think that translation is necessary, or rather, indispensable, to communicate and bring a concept closer to people who belong to different cultural realities. An important element for me is taking into account that every communicative act has a communicative residue; a concept, word or expression that seems to make our translation come to a standstill and to make it impossible to continue. So it is essential to have the ability or skill to see which parts of the message could be misunderstood and which tools could be used to compensate for this residue.

Attention must then be paid to the reader and the context; because every discourse we make, written or oral, is influenced by its cultural context. It is as though there were a border that united two cultures and separated them at the same time, making the differences clear. For me it is here, on this border, where translation takes place.

It could be claimed that the resources available to the translator through information technology imply a change in the relationship between the translator and the text, that is to say, a new way of translating. However, there is the development of new capabilities, which leads us to point out a number of essential aspects of the current situation. Translating with the help of the computer is definitely not the same as working exclusively on paper and with paper products such as conventional dictionaries, because computer tools provide us with a relationship to the text which is much more flexible than a purely lineal reading.

Furthermore, the Internet with its universal access to information and instant communication between users has created a physical and geographical freedom for translators that were inconceivable in the past. Translators need to accept the new technologies and learn how to use them to their maximum potential as a means to increased productivity and quality improvement. As we mentioned there are problems of ambiguity when working with MT, and those problems are also common for us.

References

[1] Papadakis, S., & Kalogiannakis, M. (2017). Mobile educational applications for children: what educators and parents need to know. International Journal of Mobile Learning and Organisation, 11(3), 256-277.

[2] Vidas, T., Zhang, C., & Christin, N. (2011). Toward a general collection methodology for Android devices. The digital investigation, 8, S14-S24.

[3] Chen, M. Y., Lughofer, E. D., & Hsiao, K. L. (2013). Android smartphone adoption and intention to pay for mobile internet. Library Hi-Tech.

[4] Kayode AA, Adeniyi AE, Ogundokun RO, and Ochigbo SA (2019). An Android based blood bank information retrieval system. J Blood Med. 2019; 10:119-125. https://doi.org/10.2147/JBM.S197350

[5] Emmanuel Abidemi Adeniyi, Joseph Bamidele Awotunde, Roseline Oluwaseun Ogundokun, Paul Oluwatoba Kolawole, Moses Kazeem Abiodun, Abosede Adepeju Adeniyi (2020) Mobile Health Application And Covid-19: Opportunities And Challenges. Journal of Critical Reviews, 7 (15), 3481-3488. doi:10.31838/jcr.07.15.47

[6] Sadiku, P. O., Ogundokun, R. O., Habib, E. A. A., & Akande, A. (2019). Design and Implementation of an Android Based Tourist Guide. International Journal of Modern Hospitality and Tourism, 1(1), 1-33.

[7] Okpor, M. D. (2014). Machine translation approaches issues and challenges—International Journal of Computer Science Issues (IJCSI), 11(5), 159.

[8] Suendermann, D., Liscombe, J., Dayanidhi, K., & Pieraccini, R. (2017). U.S. Patent No. 9,558,183. Washington, DC: U.S. Patent and Trademark Office.

[9] Bastings, J., Titov, I., Aziz, W., Marcheggiani, D., & Sima'an, K. (2017). Graph convolutional encoders for syntax-aware neural machine translation. arXiv preprint arXiv:1704.04675.

[10] Ahmadnia, B., Haffari, G., & Serrano, J. (2018, October). Statistical machine translation for bilingually low-resource scenarios: A round-tripping approach. In 2018 IEEE 5th International Congress on Information Science and Technology (CiSt) (pp. 261-265). IEEE.

[11] Dew, K. N., Turner, A. M., Choi, Y. K., Bosold, A., & Kirchhoff, K. (2018). Development of machine translation technology for assisting health communication: A systematic review. Journal of biomedical informatics, 85, 56-67.

[12] Anderson, S. R. (2010). How many languages are there in the world? | Linguistic Society of America. Retrieved March 6, 2020, from https://www.linguisticsociety.org/content/howmany-languages-are-there-world

[13] Kobayashi, Y. (2002). The role of gender in foreign language learning attitudes: Japanese female students' attitudes towards English learning. Gender and education, 14(2), 181-197.

[14] Pennesi, K. (2007). Improving forecast communication: linguistic and cultural considerations. Bulletin of the American Meteorological Society, 88(7), 1033-1044.

[15] Kumar, A. (2020). News Language and Sensational Issues in Hindi News: An Empirical Study on Hindi News Anchors. Our Heritage, 68(30), 1-9.

[16] Magstadt, T. M. (2020). Understanding politics: Ideas, institutions, and issues. Cengage Learning.

[17] Javier, R. A., & Lamela, M. (2020). Cultural and Linguistic Issues in Assessing Trauma in a Forensic Context. In Assessing Trauma in Forensic Contexts (pp. 151-176). Springer, Cham.

[18] Graff, D., Meslec, N., & Clark, M. A. (2020). Perceived analogical communication in design teams: Development and validation of a scale. Design Studies.

[19] Uslu, B. (2020). The effect of foreign language acquisition on preschool children's self regulation and social skills. European Early Childhood Education Research Journal, 1-20.

[20] Mackey, W. F. (1991). Language diversity, language policy, and the sovereign state. History of European Ideas, 13(1-2), 51-61.

[21] National Research Council. (, 2011). Allocating federal funds for state programs for English language learners. National Academies Press