



Insights Report

Contextual Inquiries around the use of machine translation services

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About the Study

Project Background

Machine translation has the potential to help the Wikimedia Foundation achieve their vision - *'Enable more people to access or contribute content to Wikipedia in their native or preferred languages.'*

However, lacking good quality machine translation services that editors can benefit from may limit machine translation-assisted content production.

*MinT is a new translation service by the Wikimedia Foundation Language Team, that aims to expand the current machine translation support and grow small Wiki's.

MinT can support 200+ languages, and focuses particularly on underserved languages that are getting machine translation for the first time.

Study Objectives

Given this background, the Wikimedia Foundation engaged the Indian user research consultancy Anagram Research, to conduct a multi-part research study.

The broad objectives of the study were to gain insights around how MinT might better support more readers and contributors, including Awadhi and Chhattisgarhi native speakers receiving machine translation support for the first time.

Note - Specific rationale behind the selection of target languages / Wiki's for this research are detailed at [https://meta.wikimedia.org/wiki/Research:MinT_\(Machine_in_Translation\)_Research#Research_Approach](https://meta.wikimedia.org/wiki/Research:MinT_(Machine_in_Translation)_Research#Research_Approach).

Study Objectives

- **Part 1** of the research was focused on getting user feedback for up to 5 new MinT concepts.
The concepts were geared towards increasing reader awareness and access to encyclopedic content, as well as exposing readers to possible contributorship.
- This part of the research also attempted to gain a high level understanding about the experiences and perceptions of readers and editors, when using machine translation both on and off Wikipedia.

Study Objectives

Part 2 of the research was designed to be more generative in nature.

The research objectives were to:

- Understand how monolingual readers who have the ability to read and write in Hindi + lower resourced languages (Awadhi and Chhattisgarhi) are currently using machine translation in their daily pursuit of individual learning and education.
- Understand how MinT could help reduce language barriers to knowledge.

Research Methodology (Part 2)

Contextual Inquiry (CI)

Each session was of 75 minutes duration, and conducted remotely over Microsoft Teams.

In order to uncover workflows and provide an evaluative assessment of different machine translation services, the sessions emphasized task-based inquiry. (Contextual Inquiry)

During these sessions, we attempted to:

- Investigate the socio-cultural contexts of monolingual readers
- Identify specific language-related concerns around machine translation
- Understand motivations and barriers to content contribution

Note - This insights report documents the findings of Part 2 of the multi-part research. Findings of Part 1, are available in [separate reporting](#).

Participants (Part 2)

Contextual Inquiry (CI)

12 monolingual readers participated in Part 2 of the research.

Monolingual readers were defined as ‘Readers who may be multilingual to some degree, but generally prefer to read content in one language.’

- 6 native Awadhi or Chhattisgarhi speakers
- 6 native Hindi speakers

Executive Summary

- ★ Currently, MT services serve the practical objective of helping readers independently understand content in unfamiliar languages.

However, for translated content to replicate the authentic and immersive experience of reading original content, translation services must transcend beyond conveying literal, denotative meanings.

For some readers, *addressing this gap is the motivator to use a solution like MinT. Explicitly communicating this, could inspire more readers to use MinT.

- ★ With the increasing availability of Hindi content online, and ready access to translation solutions, urban native speakers of Awadhi and Chhattisgarhi don't face significant barriers to knowledge that are linked to language ability.

However, by addressing relevant limitations in automatic translation, MinT could support the cultural and emotional needs of these readers by enabling them to enjoy more reading content in their native language.

- ★ The challenge for advancing translation quality lies also in capturing the essence of the original writing while presenting it in a way that remains meaningful and relevant within the cultural context of the translated language.

Advanced MT features geared towards handling *the intricacies of language and culture, are needed to address this limitation.

- ★ Promoting the translation of Wikipedia content by readers through a solution like MinT can enhance a broader sense of community engagement, beyond Wikipedia editors.

Nevertheless, **some readers share concerns about the impact of poor quality translations and unverified contributors on online/Wikipedia content quality and integrity.

Lacking confidence in their ability to contribute, other readers prefer to contribute minimally or by providing feedback.

Offering a range of contribution options, and including quality check and feedback into the process could encourage and support more readers towards using MinT.

★ Research highlights relevant sociocultural considerations that should be taken into account when designing translation solutions:

- Language proficiency can vary among individuals who are native speakers of a language.
It cannot be assumed that those who can speak a language fluently, are equally comfortable reading and writing in the same language.
- The 'chosen' reading language can be different from the 'preferred' reading language - and can change dynamically with context or content type.
- At times, readers 'toggle' between languages to aid comprehension.
- Some native speakers consider *Chhattisgarhi to be a 'spoken language' or a 'tone', rather than a

distinct language and are typically comfortable reading content in Hindi or English.

- On the other hand, **auto detection of Hindi-dialects as Hindi leads to poor translation.

Culture sensitive translation solutions could include functions to:

- **Support diversity in language proficiency / Language consumption or contribution preferences**
- *****Easily toggle between or view content in multiple languages**
- ******Recommend or automatically translate content to the language most suitable for a given situation**
- **Support the unique nuances that characterize and differentiate dialects**
- **Accurately detect and support Indian dialects**

(Contd - Sociocultural factors)

- For some, translation doubles up or promises to be a way to *improve or revive language skills.

Translation solutions could potentially extend to language learning features or resources to improve overall language skills.

- ‘Low exposure users’ and ‘New-to-Net’ users are commonly acknowledged archetypes representing specific segments of the Indian population.

This research highlights additional user groups with unique needs - ‘Low exposure’ users, and users with limited data plans.

Simplified and offline-accessible features or translation solutions have the potential to cater not only to these specific user groups but also to a wider audience.

- ★ *Some readers use machine translation to write faster in a language where they lack written fluency - recognizing that a good translation can serve as a time-saving template or 'first draft'.

Content is then 'finalized' by manually correcting or tweaking the translation.

The 'Review and Correct' function of MinT supports this reader behavior, and can be further enhanced through relevant features to:

- Facilitate faster typing or correction

(E.g. Auto complete, Speech-to-Text, Transliteration)

- Incorporate connotative meaning or mitigate language and cultural context limitations

(E.g. Auto suggest synonyms, Easy cross reference between translation and original article)

- ★ Research highlights instances of readers using search results and seeking additional dictionary support to complement / supplement translation.

Search results were used in the context of translation errors and reflect an alternate conceptual model of translation held by some readers.

Both these practices suggest that readers may have a desire for a more comprehensive understanding, clarification or verification of translated material.

- ★ The 'Translation Workflows' section of the report culminates with a summarization of Pain Points, Gaps and Latent Needs.

These insights reinforce that there is an opportunity for MinT to have broader relevance outside Wikipedia

- As a new translation solution that effectively addresses the gaps and the range of explicit and latent needs that are currently unmet.

- ★ Studying the translation workflows of monolingual readers also highlights the features and aspects of translation solutions that readers find valuable.

These findings offer inspiration for future iterations of MinT and are summarized at the end of the 'Translation Workflows' section.

Pain Points

[Slide 113](#)

- Translating Lengthier Text
- Understanding 'difficult' words while reading content online

[Slide 117](#)

- System detection of Hindi dialects as Hindi
- System selection of closest supported language as source language
- Incorrect language detection
- Incorrect language selection by readers undetected by system
- Understanding the meaning of 'difficult' words in the translated text

[Slide 119](#)

- Translation through screen capture
- Speech-to-text translation services

Gaps / Latent Needs

[Slide 125](#)

- Same Language Translation (Formal > Simple language)

[Slide 127](#)

- Effective translation of connotative meaning

[Slide 132](#)

- Balancing language intricacies between languages from diverse cultural contexts

[Slide 135](#)

- Recommendations on most accurate language pairs for translation

Value

[Slide 121](#)

- Auto detection of languages
- Search results that compliment translated content
- Offline-accessible features

[Slide 122](#)

- Pronunciation feature / Audio option / Transliteration
- Auto-complete word suggestions

General Insights

Chosen reading language

The language used in daily life, education or work becomes the chosen reading language for online content.

For some, English becomes the predominant reading language because of convenience or practicality.

RITE interviews conducted prior to the CI sessions highlight that the chosen reading language:

- Can vary based on the type of online content to be consumed*
- Can evolve over time and is fuelled by *internet usage, **content availability and reliability*

“I have done all the schooling and education in English medium. And English has become a useful language.

I will give you some examples... Like I have an engineering background. I can explain to you the topic ‘amplifier’ in Hindi but I don't know the term for ‘amplifier’ in Hindi. Or the engineer is called ‘abhiyanta’ which we don't know.

So it is convenient to express anything in English.”

(P30 - Monolingual Reader)



“It’s not about my preference, but across the rest of the world, English is preferred.

So when I submit anything (research papers) it is in English only.

Even when I speak to different professors out of India and I have to submit anything to them then it is in English only.

That is why I have to prefer English.”

(P35 - Monolingual Reader)



“I have been a student of Hindi. That's why I prefer Hindi a little bit. I have friends who are from English medium and they read content in English.

But I have no other option apart from reading in English. There are a lot of things that are only available in English.

Or I can say a lot of words are modified in such a way that it's in shortcut and English will be better for it.

So for these few things, I think English is better.”

(P34 - Monolingual Reader)



Preferred reading language

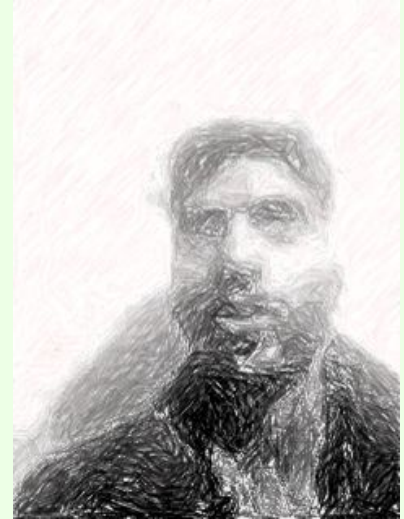
However, chosen reading language is not always the preferred language.

Irrespective of the chosen reading language, reading online content in their native language gives many readers a 'comfort feel'.

*“I prefer Hindi mostly.
Because firstly, it is my mother tongue.*

*And further as we are Indians, we also speak in Hindi.
We communicate in Hindi. So there is a ‘flow’ in Hindi
language. When you hear any language more, the brain tends
to understand it better. So even my brain understands better in
Hindi.
So I feel more comfortable in Hindi because it is used in my
daily life.”*

(P26 - Monolingual Reader)



Translation Services

- Google is the most *popularly used translation service, primarily because of brand ubiquity and trust.

Individual participants also use / have used:

- Yahoo! Babel Fish (Now Bing Translator)
- Multifunctional services like Chat GPT and Google Bard
- DeepL Translator

*“It is more convenient for me to just click it and get the result on **Google**.*

I don't prefer to open a new app and then copy-paste it and then see the desired result.

As Google is providing the feature by itself.”

(P30 - Monolingual Reader)



*“There is one more app called **DeepL**, but for that you have to pay some amount of money.*

I use that as well (in addition to Google Translate) because there is no word limit in it.

So I can upload complete papers on it. But with Google Translator you can just translate 4-5 paragraphs in one go.”

(P35 - Monolingual Reader)



“When I translate the Japanese or Russian languages for example, the accuracy is very low. The meaning comes out to be totally different from the actual one.

*I used Google translate earlier, now I use **Chat GPT**.
I feel that ChatGPT gives an accurate response in comparison to Google Translate.”*

(P04 - Editor - RITE session)



Translation Services

Also commonly used are:

- Dictionary apps - For offline access.
- Online dictionaries - Although basic dictionary functions are available on Google Translate, readers who need *additional support to understand a word currently revert to online dictionaries.
- Auto Translate options on Facebook and other websites.

*“I have an app called ‘**Hindi Dictionary**’. I can type any word. It automatically gives the meaning. It shows whether it is a noun or a verb. If you cannot read something, they have an option to read also. If I select this, it will read it aloud.*

With this I can sometimes be offline also. It has some preloaded words which can be searched even without the Internet. If I am at a place where there is no Internet then this will be helpful. But it has very limited words. If I want to search for more words then I have to go online.

There will be certain words that we wouldn’t be able to understand without examples. For that, we have to go online.”

(P29 - Monolingual Reader)



“For Google, you need to have internet connection or you should have the app downloaded.

*But in case of **Shabdkosh dictionary**, you already have words that are pre defined. So you just need to look for the specific word. And you will get multiple meanings directly. So if you don't have the internet connection, you just have to search the word in the dictionary and you will get multiple meanings.”*

(P26 - Monolingual Reader)

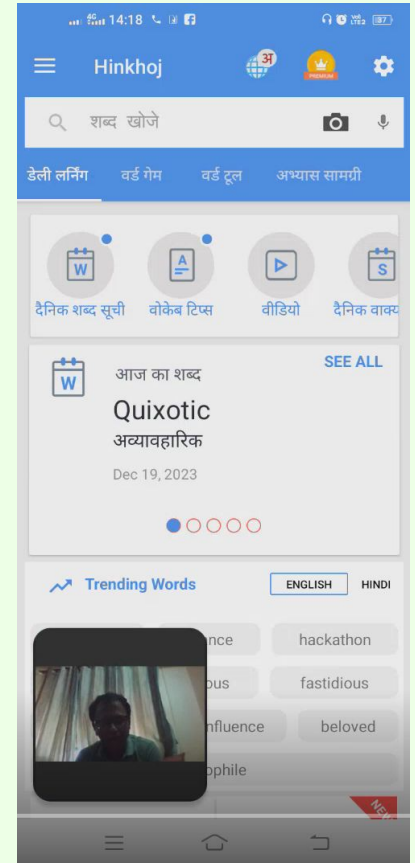


P34-Monolingual Reader uses the **‘HindKhoj’ dictionary app** to improve his English.

The ‘Word of the Day’ feature helps him learn new words. The word of the day is usually a word related to the current context / events.

He has been using this for the past 4 years, and uses it whenever he is free.

Through this app, he reads the word meaning, synonyms and antonyms as well as understands word usage.



Translation Use Cases

Readers use translation for different reasons:

- Content Consumption
 - Understand content in an unfamiliar or non-preferred language
 - *Understand unfamiliar / difficult words in the chosen / preferred language
- Communication
 - To communicate with others
 - Reply to emails / chats in a language where written fluency is lacking
- Improve language skills for an unfamiliar language

“I don’t know how to type in Hindi using the keyboard. Mostly I spell in English using Hindi words and it gets translated word by word in Hindi.

Like for example, my cook uses WhatsApp and whenever I have to give instructions to her she cannot read in English, so every time my Google Translator translates it into Hindi to give instructions to her.

It is a routine for me to translate something or the other for her everyday that today you have to do this and all that.”

(P35 - Monolingual Reader)



Expectations on service quality

For general / casual use, the bar for translation quality is not high.

Readers are grateful that there is an option to independently understand content in unfamiliar languages.

“My friends say that Google translate is not as correct as we think it is. I think it's fine. But they say we can't rely on this.

It's fine, you don't have any other option with you for translation. We can't ask others for help. So if I want to read something, then whatever I get is best for me. If I am getting Google translate, then Google translate is best for me. Because you don't have any other options. To whom you will ask to read it to you?”

(P34 - Monolingual Reader)



Expectations on service quality

Readers have fundamental expectations on translation quality:

- No grammatical errors
- Accuracy to original content
- Easy to understand language - Colloquial 'everyday' language vs. 'advanced' or formal language that would need further help to understand.
- Readable font

“It is not about reading but about making sense of it.

*If I can read the words but unable to understand the meaning
then what is the point?*

If it is in simpler words then it would be better.”

(P35 - Monolingual Reader)



Trust

- High trust in the brand translates to basic trust in the translation quality.
- Positive experiences with translation between languages that one is familiar with, establishes trust in utilizing translation services for completely unfamiliar languages.

"It's such a huge company and till now I didn't have any problem so I can trust Google.

Trade mark has a lot of value, sir.

We know if we are wearing Reebok shoes then it won't break and we won't fall. It brings a kind of confidence in a person.

If the brand won't be there then I would not trust it.

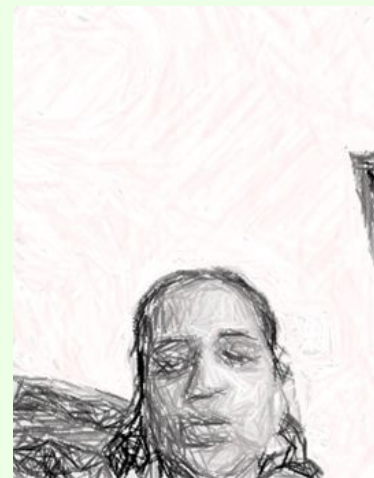
If I have to know the Italian words then I would take the help of Google translate and whatever it has translated I will believe that it's correct."

(P34 - Monolingual Reader)



*“I have to trust it because I don’t know the things which were given in the blog.
Everybody puts their content on Google so, Google reads that only and whatever I have searched on Google till date, they all were correct.
That’s why I trust Google.”*

(P36 - Monolingual Reader)



Trust

- However, there is a trust gap when it comes to using automatic translation for critical purposes.

(Examples shared by study participants include - accessing academic content, official communications)

“There are a lot of things where we don't want to take risks. If I have to submit an application for railway ticket cancellation, then I will write the application in Hindi.

I won't trust Google translation because the railway officials are English medium. Their English is good because they are from the South.

So I will try to ask a friend or someone at home and not use Google translate at that place.”

(P34 - Monolingual Reader)



Perceptions on quality

Individual participants shared their perceptions about factors influencing translation quality:

- ‘Integrated’ or inbuilt translations are considered more accurate in conveying context and aligning with the intended meaning.
- Translation quality is perceived to be better for topics that have a greater volume of available online information.

'Integrated' or inbuilt translation

"So it's better that the translation should be on the site itself.

Otherwise, it is not necessary that it will take the exact (intended) word, it is possible that it will take another synonym of that.

*On the Delhi metro site, the translation was 'plan your journey' and Google made it 'plan your trip'.
Google took the meaning but not the exact word."*

(P30 - Monolingual Reader)



Topic of content to be translated

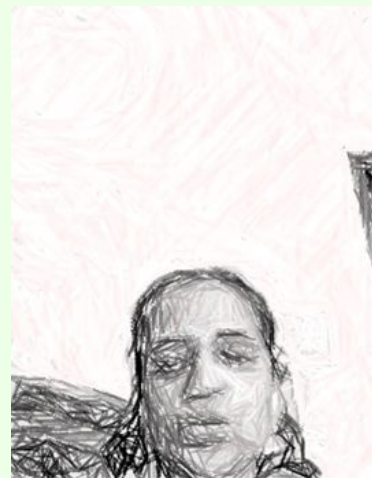
“Maybe because machine read this topic (ice cream) properly and they have given more information to the machine about this topic. That’s why I find this translation better.

They might have given less information about Bangla one and machine has not read it properly. It has done word to word translation that’s why I couldn’t understand it.

This is the only reason I think.

But yeah, if there is no other article related to it, then I will get problem in reading and understanding it.”

(P36 - Monolingual Reader)



Gauging translation quality

There are different ways by which readers gauge translation quality:

- *'If it read's all right - 'Kitabi' language - Like reading a book'*
- *'Comparing translated headings to the translated content to see if they 'match'*
- *'Use senses to see if the translation is related to the topic' / 'meaningful to the context'*
- *'Incorrect grammar / punctuation / typos' and 'Incomplete / partial translation' cue poor translation quality*

Incorrect syntax

“See when you are reading the original, then the first line you read and the second one is leading to it. It is like that. It is not haphazardly put there.

The syntax of grammar is completely different in Hindi and English and when you translate it from Hindi to English then sometimes it gets haphazard.

It is not like that over here. That’s why I am saying that this is good translation.”

(P35 - Monolingual Reader)



Meaningful to the context

“If it is related to the topic (blog) then I will understand that it must have been translated correctly.

If the sentence doesn't make any sense, like for example: I am saying that 'I am hungry' and if it says that 'I need something to eat', then it is relatable to the sentence.

But, if they are saying, 'I am going to play' which is not at all relatable. That has no meaning.”

(P27 - Monolingual Reader)



Incomplete / Partial translation

“Sometimes when I translate something from English, its translation into Hindi will be half-way. The word formation also changes which makes me feel that it is not translated accurately. A few words either will disappear or the sentence structure in Hindi is not accurate. That is when I feel that the translation is incorrect.

If there is such a long content and it is translated from English into Hindi, some gets translated and some doesn't.”

(P33 - Monolingual Reader)



Gauging translation quality

Some readers also attempt to assess translation quality by making comparisons outside the translated text:

- *'Compare 'machine translation' to 'informal' translation by friends'*
- *'Points of comparison - Between the original and translated language'*
- *'Translate into two known languages - Discrepancies between translations cue translation inaccuracies'*

Points of comparison

“Like in the Awadhi content we are not able to understand but we can see some nouns.

Like ‘Bhartendu Mishra’ is written.

‘Kanoon’, ‘Patrika’, ‘Sampadak’. These words are written whose meanings I know. ‘Sampadak’ means Editor, ‘Kanoon’ means law and ‘Rachnakar’ means creator.

Then ‘Bhartendu Mishra’. This is about the person.”

(P30 - Monolingual Reader)



Translation Workflows

Google Translation Experience

Benefiting from the trust associated with the Google brand, Google Translate has become the predominant translation service in use.

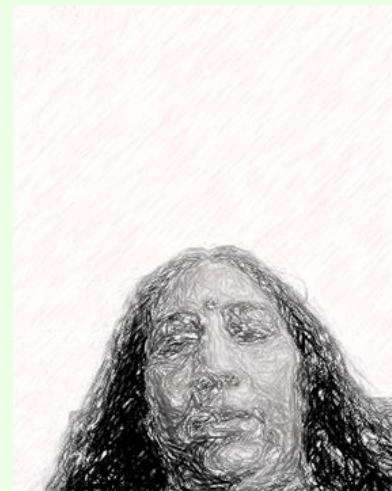
Translation through Google is convenient and accessible, since Google offers multiple translation entry points - Both on and off Google.

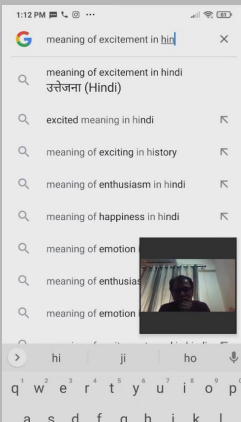
Google becomes the default choice for translation, particularly on Android mobile phones - Where built in technology removes the need to download or access a separate translation service.

(Google is the default browser, Apps like the GBoard and Google Lens are pre installed and integrated with other apps and services.)

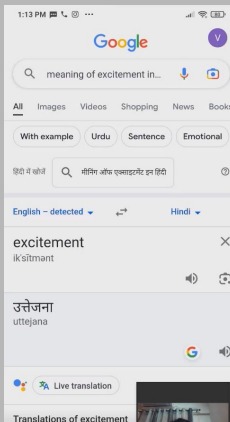
*“Google is very famous.
There are in-built apps on mobile. When you buy a mobile, you
will find the Google app in-built. You don’t have to install it
from the Play Store. Google is already updated.”*

(P32 - Monolingual Reader)

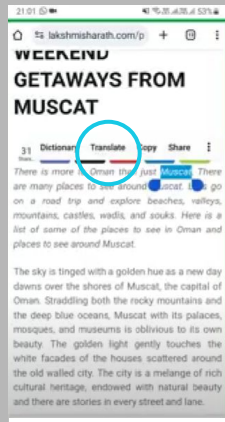
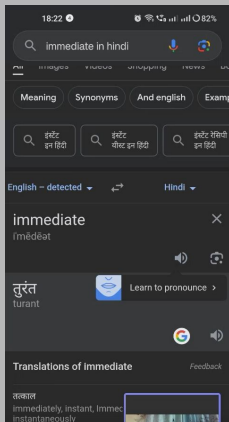
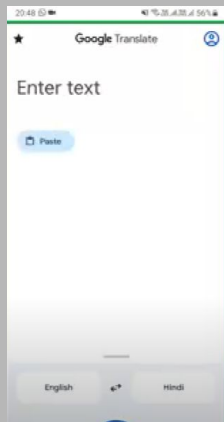




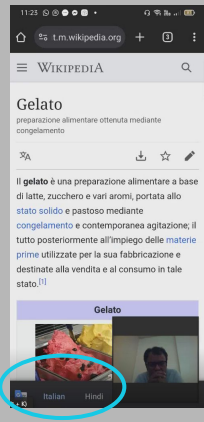
1. Google Chrome, Search



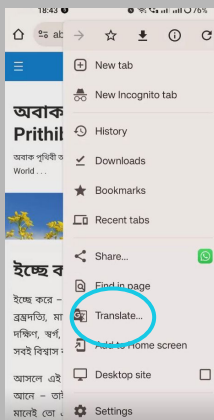
2. Google Translate App / Web



3. Pop Up Dialog



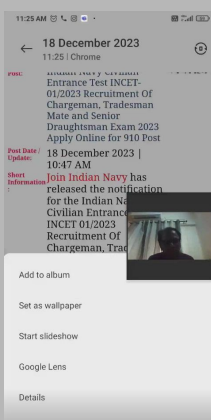
4. Persistent Footer



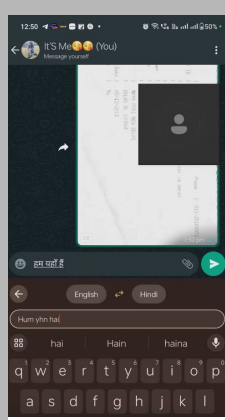
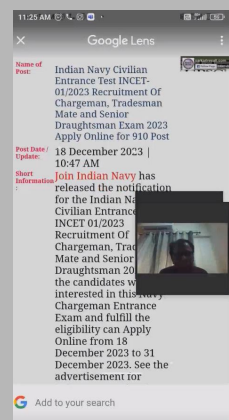
5. Overflow Menu



6. Auto Translate



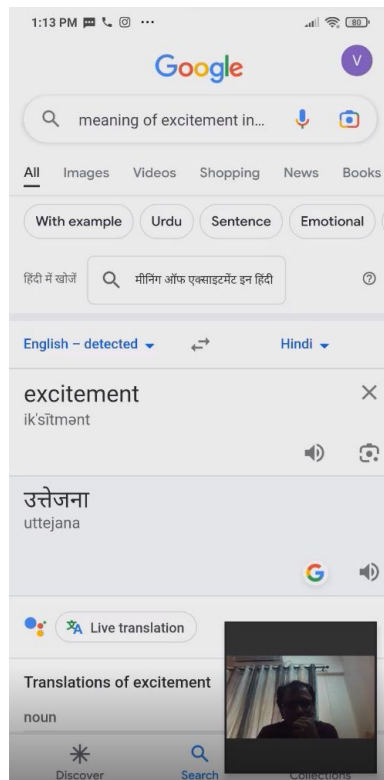
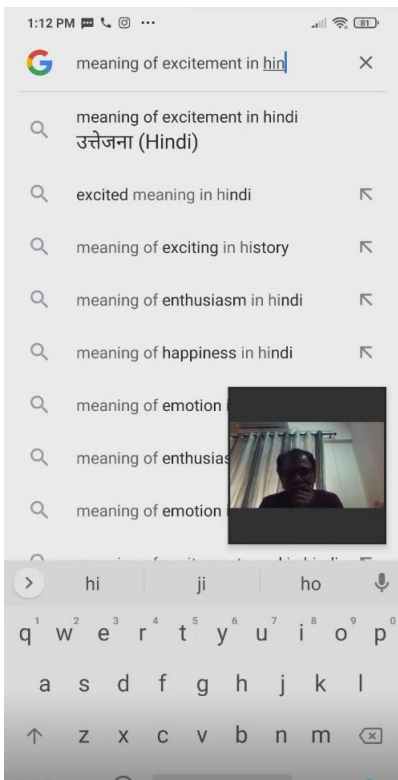
7. Google Lens



8. GBoard

Eighteen workflows, via eight different Google Translate entry points were observed and documented through the research study.

Translating a Word



Workflow 1

Type query in Google Omnibox > Google Translate

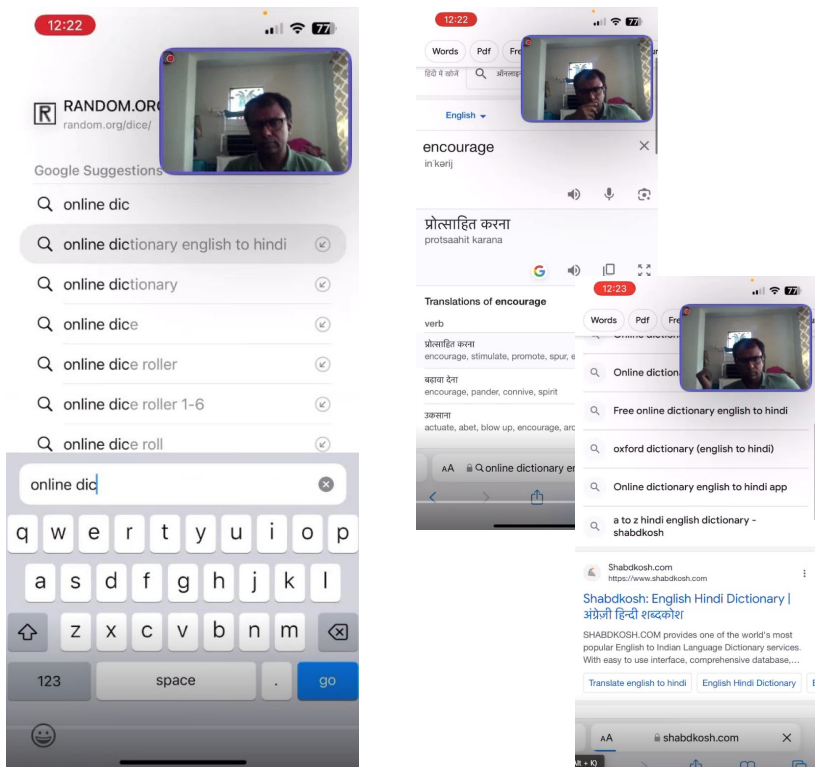
Already used extensively for general online browsing and searching, Google Chrome / Search have seamlessly become start points for translation.

Readers attempting to find the meaning of words in specific languages, type their translation query into the **Google omnibox** and are directed to **Google Translate**.

Examples of translation queries used by study participants include:

- *'meaning of excitement in hindi'*
- *'excitement meaning'*
- *'translate excitement to hindi'*

Translating a Word



Workflow 2

Type query in Google Omnibox > Google Translate > Shabdkosh Online Dictionary

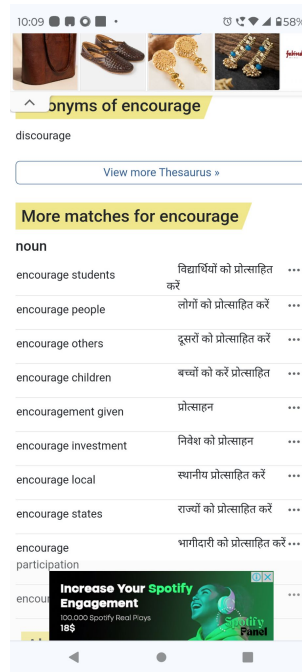
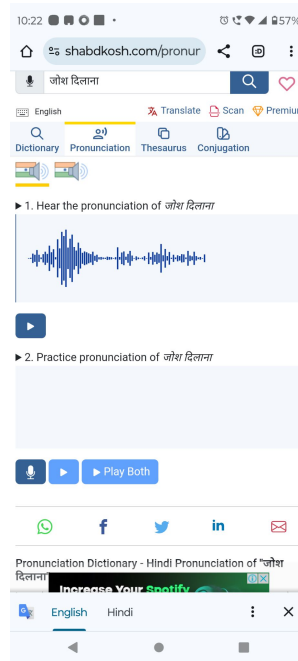
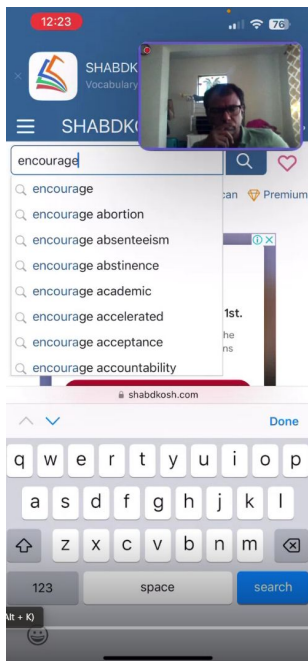
To find the English meaning of a Hindi word, P27-Monolingual Reader uses the translation query *'Online dictionary English to Hindi'*.

This results in Google Translate as the first result, and the *Shabdkosh dictionary as the 2nd result.

While **Google Translate** is sufficient at times, she clicks into **Shabdkosh** when she needs more detailed dictionary inputs.

- *Word usage in a sentence*
- ***Pronunciation*
- *Additional synonyms*

Translating a Word



Opportunity - In some contexts, the provision of additional dictionary resources for translated content could better support the translation experience.

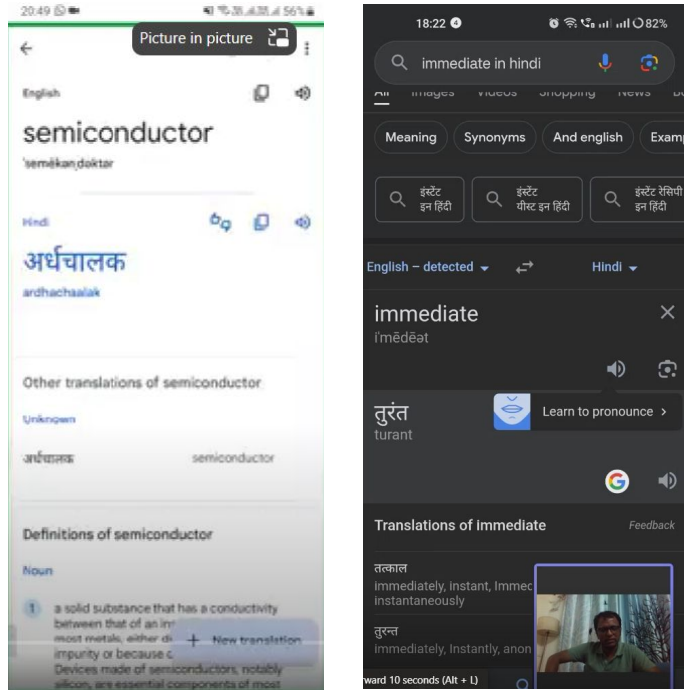
*“First I use Google Translator only.
If I do not understand the meaning of something on Google Translate, what are they exactly saying, then I will look into the dictionary, what the similar words it, and how to build a sentence using that.*

*They have options like how to use it.
They will pronounce it for you as well. They will read it out for you. Sometimes, it happens that, I do not understand the Hindi word even. Because they use typical Hindi.”*

(P27 - Monolingual Reader)



Translating a Word



Workflow 3

Type word in Google Translate app / web > Listen to Audio

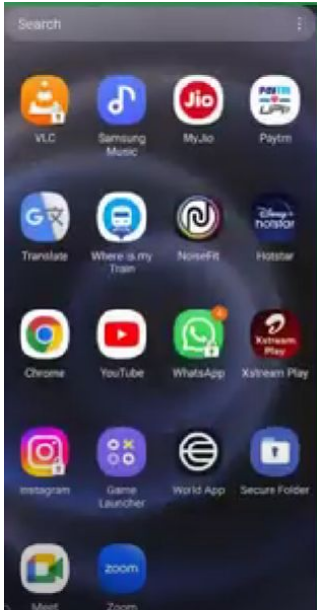
Readers also attempt to find the meaning of words in specific languages using the **Google Translate app / Google Translate web / dictionary apps.**

Readers who are not fluent with the source language / translation, sometimes utilize the **audio option** to listen to the word pronunciation.

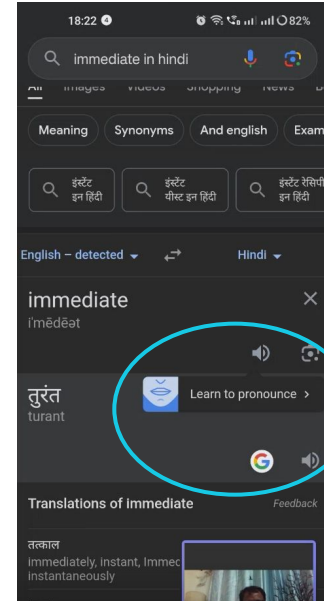
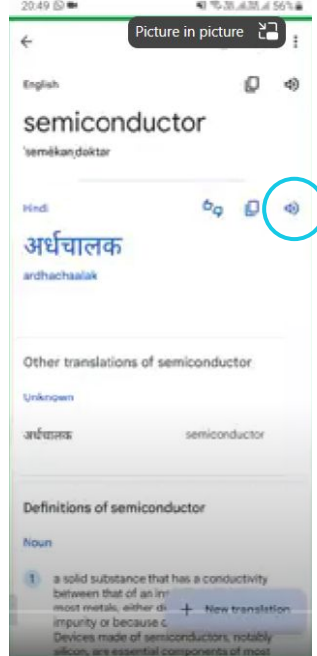
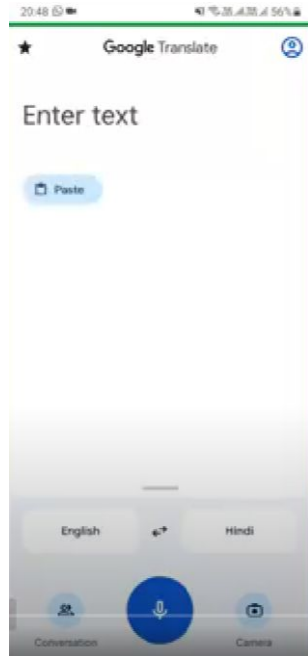
Some prefer using **apps that do not require internet connectivity**, for single word translations.

Value - Translation apps / dictionaries that work in 'offline' mode

Translating a Word



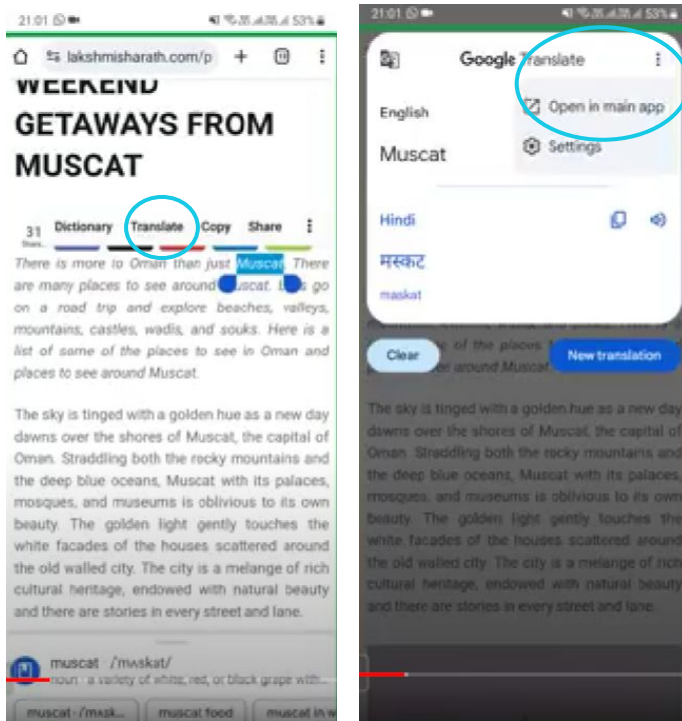
Google Translate App



Google Translate Web

Value - The audio option is appreciated by readers. Translation has helped those trying to improve a 2nd language. Native Hindi speakers who are not fluent with the Hindi script, sometimes listen to the pronunciation rather than read the translation.

Translating a Word



Workflow 4

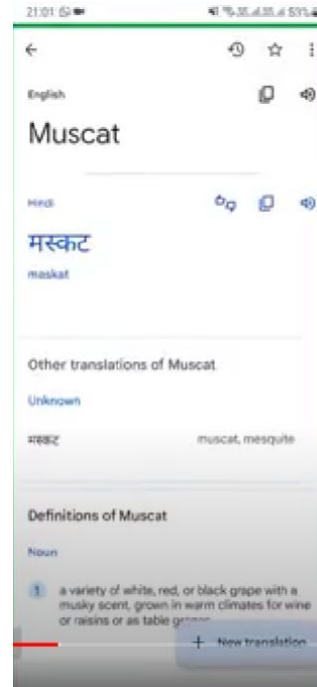
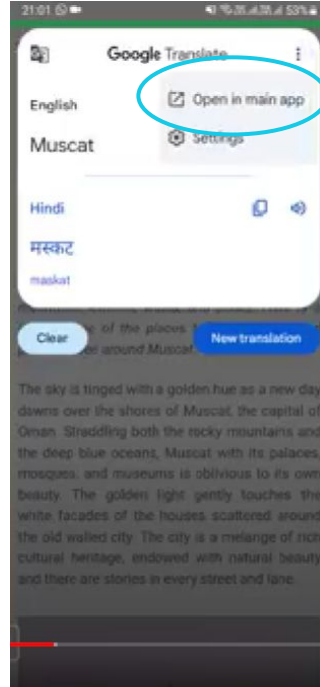
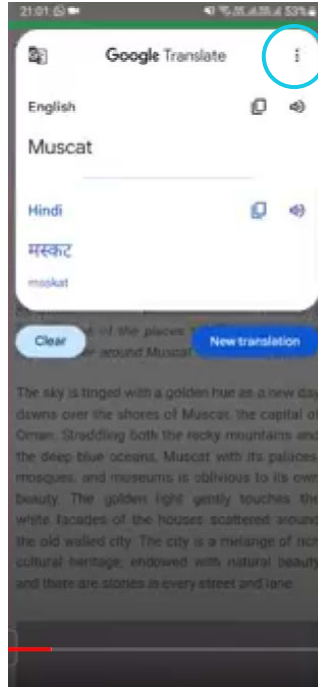
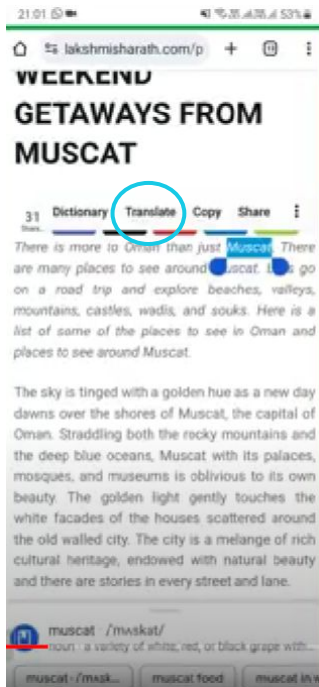
Select word on webpage > Google popup dialog > Google Translate pop up > Google Translate main app

When reading content in a language other than their default language, readers **select unfamiliar words on the screen** and easily access translation through the **Google pop up dialog**.

On P-26 Monolingual Reader's phone, this workflow is streamlined to support word translation without disrupting reading online content:

- ***Google Translate pop up*** for quick translation reference
- ***Option to navigate to the main translation app*** for more advanced translation options

Translating a Word



Value - The streamlined workflow that supports word translation while reading online content is appreciated by P-26 Monolingual reader as 'time-saving'. (However, other readers did not encounter this workflow, and had a more disruptive experience)

Translating Lengthier Text



Workflow 5

Select longer content on web page > Google popup dialog > Google Search > **Error**

The **Google pop up dialog** is also used when readers are browsing content in an unfamiliar language.

Selecting lengthier text for translation, links to **Google Search** results rather than Google Translate.

While Google Translate has a higher word limit, Search has a 32 word limit which results in an error.

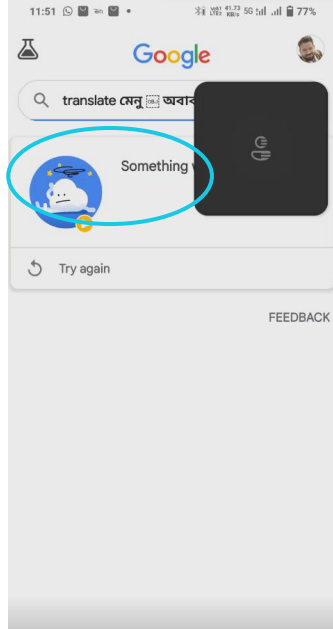
Moreover, when attempting to translate lengthier text on a webpage, other screen components tend to get selected along with text, and this results in an error.

Pain Point - Selecting lengthier text for translation results in errors.

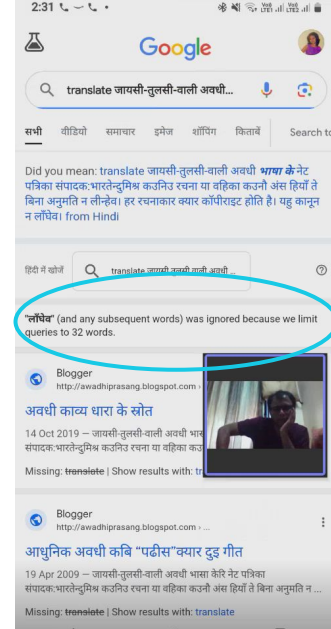
Translating Lengthier Text



Selection of additional page components along with text, results in an error

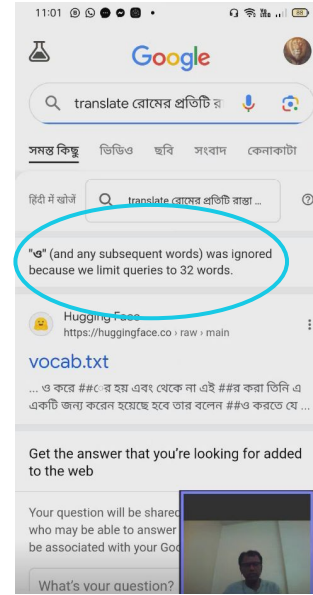
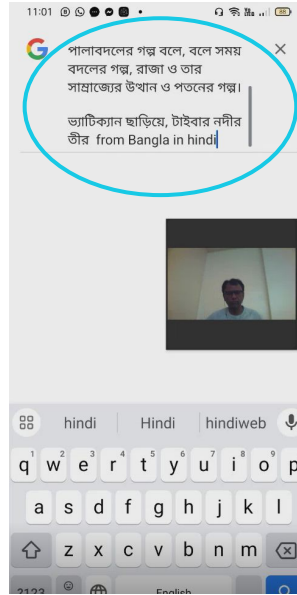
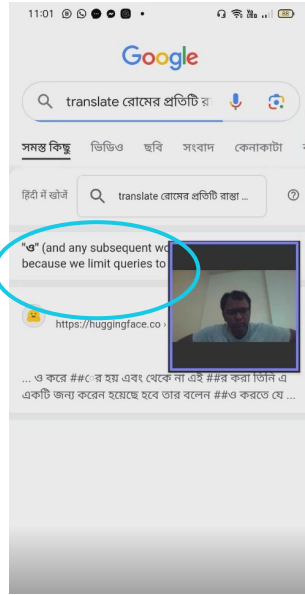
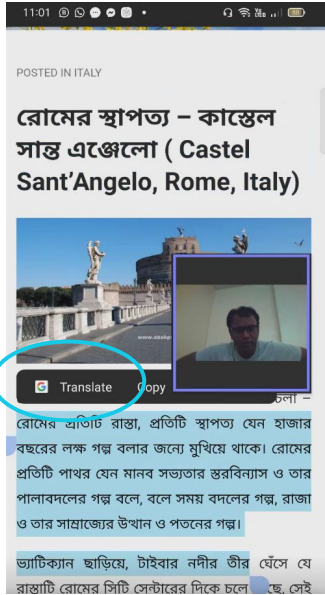


Selecting lengthier text results in a word-limit error on Google Search



Opportunity - Better translation support for lengthier text being browsed online.

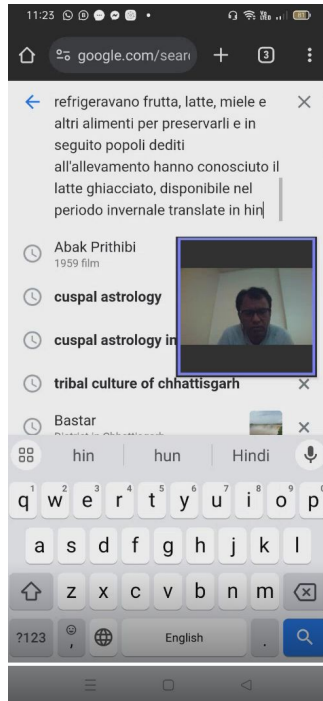
Translating Lengthier Text



P-36 Monolingual Reader unsuccessfully attempted to circumvent the error by adding 'from Bangla in Hindi' at the end of the content to be translated. When this continued to result in an error, the user attributed it to the page being copyrighted.

Pain Point - Reason for the error is not evident, as the error message is not sufficiently informative / is overlooked.

Translating Lengthier Text



Workflow 6

*Copy longer content received as a message > Paste into Google Search > **Error** > Search Results*

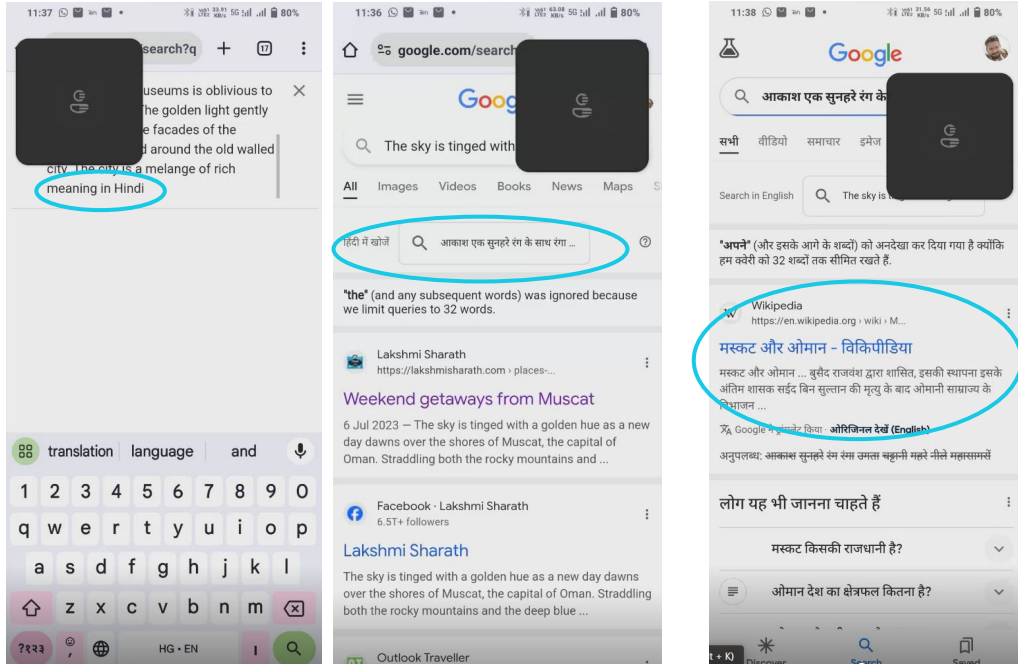
Readers also manually copy-paste lengthy text that they want to translate into Google Search.

On not seeing a translation because of a word-limit error, a few participants opt to check the search results instead.

The search results are seen as 'similar content' / 'additional information about the topic' to aid their understanding.

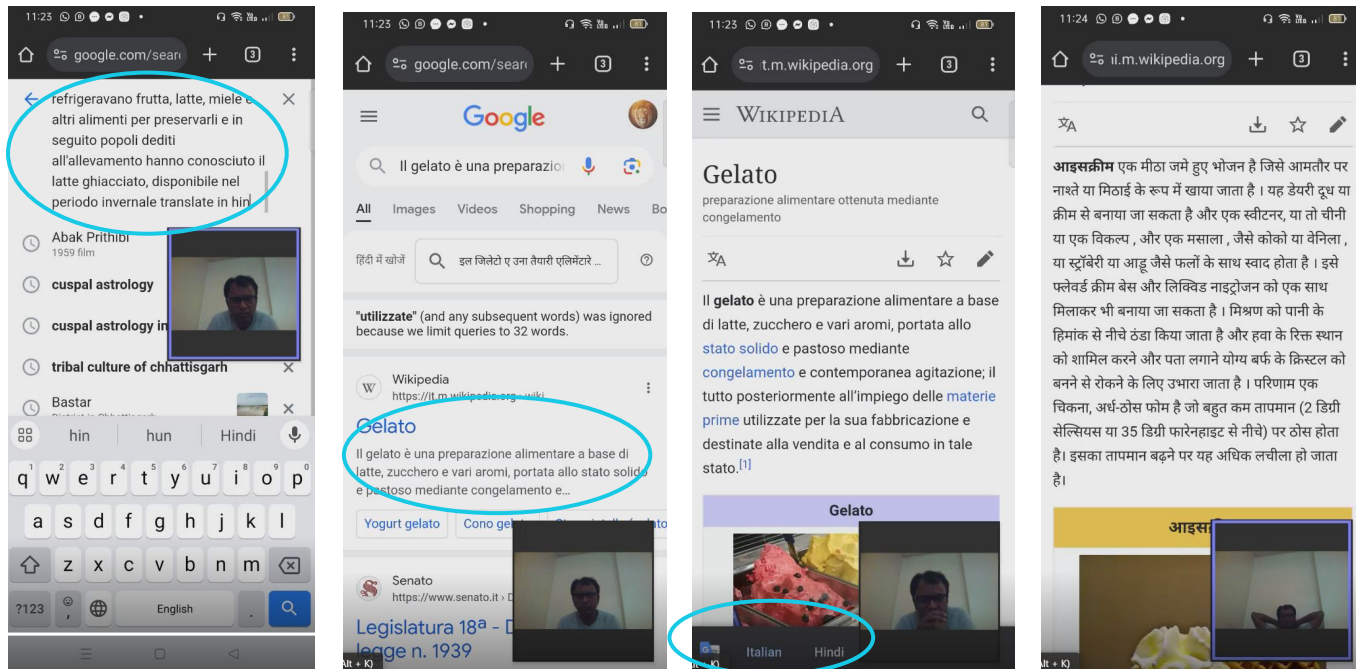
Value - *In the context of translation on Google, some perceive search results as additional information to compliment the translation.*

Translating Lengthier Text



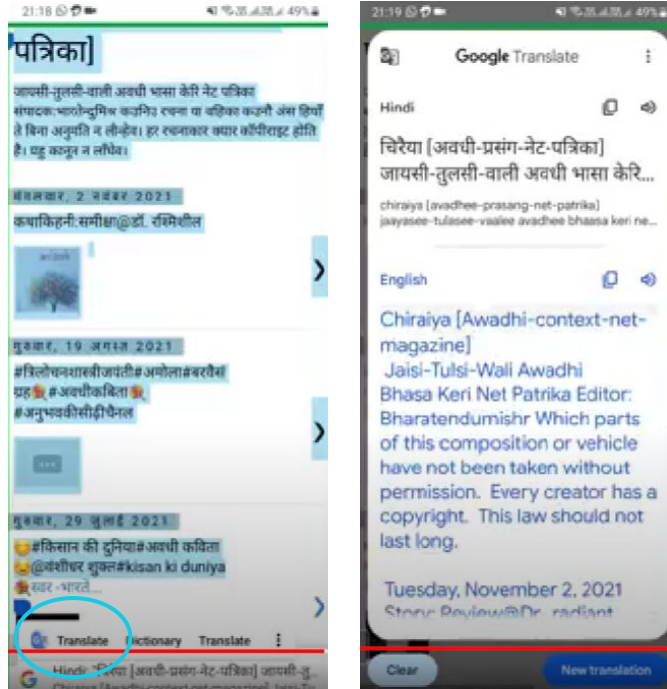
On getting a word-limit error, P-29 Monolingual Reader overlooks the error message, but checks the Google search results. Is confused why the results are in English, despite adding 'meaning in Hindi' at the end of his translation query. Clicks on 'Search in Hindi' - The 1st result in Hindi is considered 'sufficient'. Although it is not a translation of the original article, it is acceptable as 'additional information about the topic' in his preferred language.

Translating Lengthier Text



On getting a word-limit error, P-36 Monolingual Reader overlooks the error message, but checks the Google search results. In this case, the 1st search result is actually the website from where the Italian text originated. Using the persistent footer, the participant is able to translate the Italian content on Wikipedia to Hindi. (Ref - Workflow 13 - 'Select language on the persistent footer to translate all content on a web page')

Translating Hindi Dialects



Workflow 7

Select Awadhi content on web page > Google Popup dialog > *unsatisfactory result*

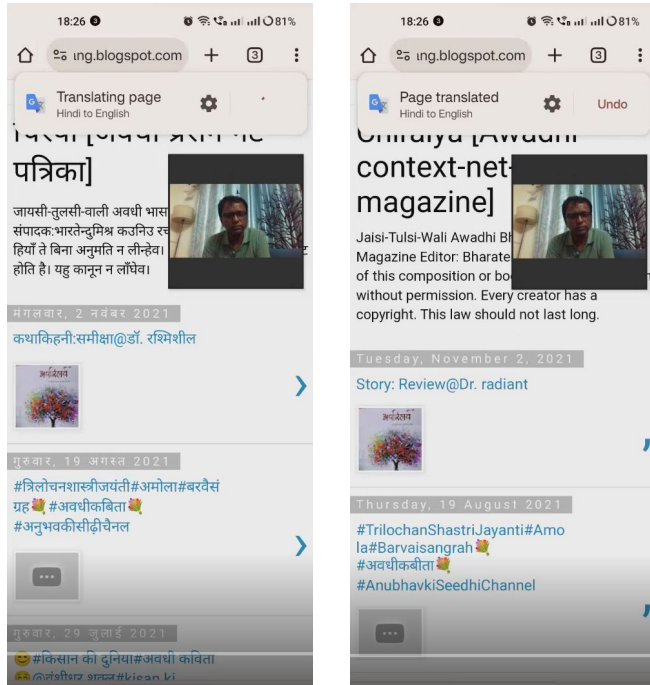
If the selected text length is within word limits, using the popup dialog correctly links to Google Translate.

However, Google auto detects Hindi dialects such as Chhattisgarhi / Awadhi, as Hindi.

Pain Point - Auto detection of Hindi-dialects as Hindi / System selection of the closest supported language as the source language leads to poor translation.

Opportunity - Improved accuracy in auto-detection of dialects.

Translating Hindi Dialects



On opening the Awadhi website content on P-28 Monolingual Reader's phone, content gets automatically detected as 'Hindi' and translated to English. This results in poor translation quality as the language detection is incorrect. (Ref - Workflow 14 - 'Automatic detection and translation of non-preferred language to preferred language')

Translating Hindi Dialects



Workflow 8

Select Awadhi content on web page > Reader selects source language as 'Hindi' on Google Translate Web > Paste content for translation into Google Translate Web > **unsatisfactory result**

User changes source language to 'Sanskrit' > **unsatisfactory result**

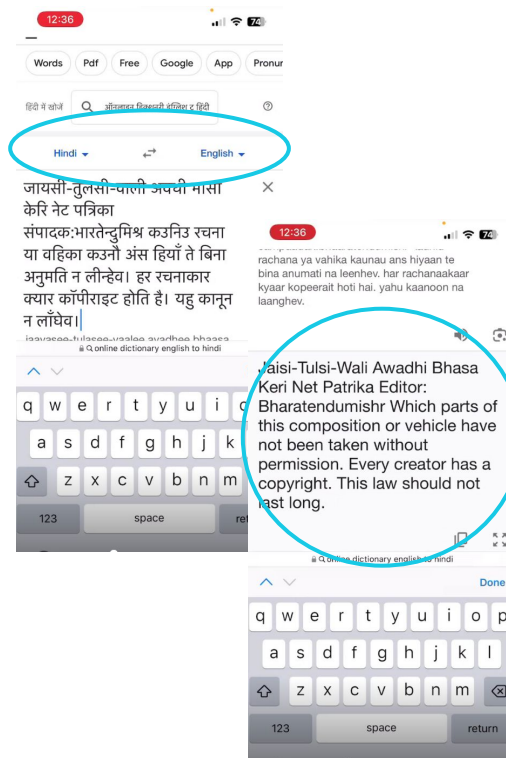
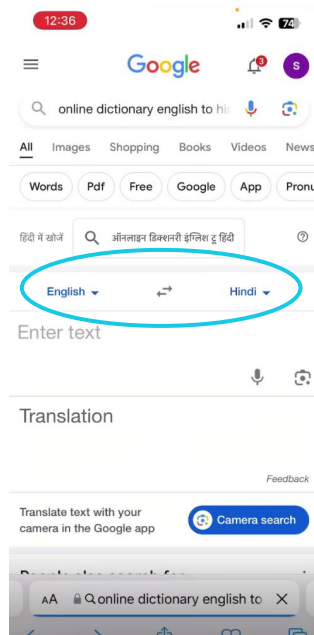
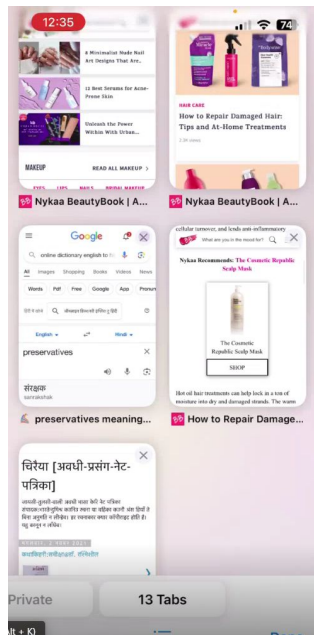
User selects translated text (in Hindi) to translate into English > **unsatisfactory result** > **Abandons attempt to translate**

At times, readers incorrectly identify Hindi dialects as 'pure Hindi' and select 'Hindi' / 'Sanskrit' as the source language for translation.

Pain Point - Incorrect language selection by readers goes undetected by the system.

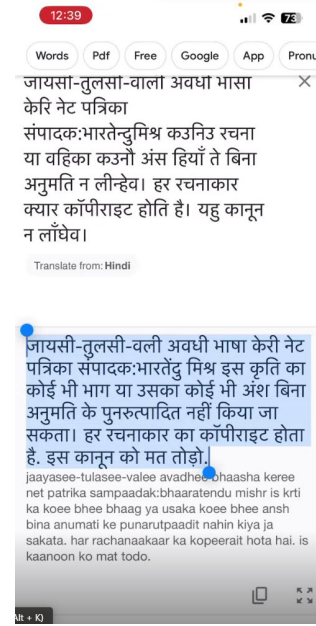
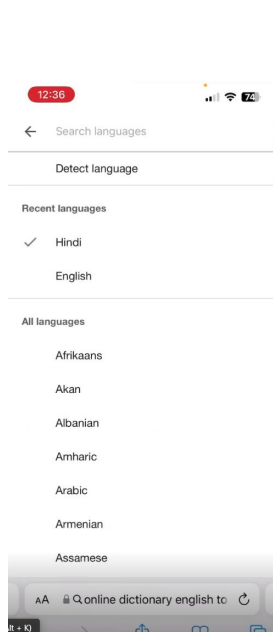
Opportunity - Error prevention to proactively address error prone conditions.

Translating Hindi Dialects



P-26 Monolingual Reader navigates tabs on his mobile phone to copy content from an Awadhi website and paste it into Google Translate. Before pasting content, he uses the language change options, but mistakes the source language (Awadhi) for Hindi. Incorrect language selection by the user results in a poor quality translation. (Continued on next slide)

Translating Hindi Dialects



The poor translation cues that the origin language may not be Hindi.

P-26 Monolingual Reader then attempts to change the source language to Sanskrit in an attempt to improve the translation quality.

However, the translation remains unclear as the source language is still incorrect.

Next, the participant attempts to translate the Hindi translation into English, but results remain unsatisfactory. The participant wishes to abandon efforts at this point.

Incorrect user detection of Hindi-dialects as Hindi / Other

*“It is in typical Hindi which I will be not able to understand.
It is like in Ramayana and Mahabharata!*

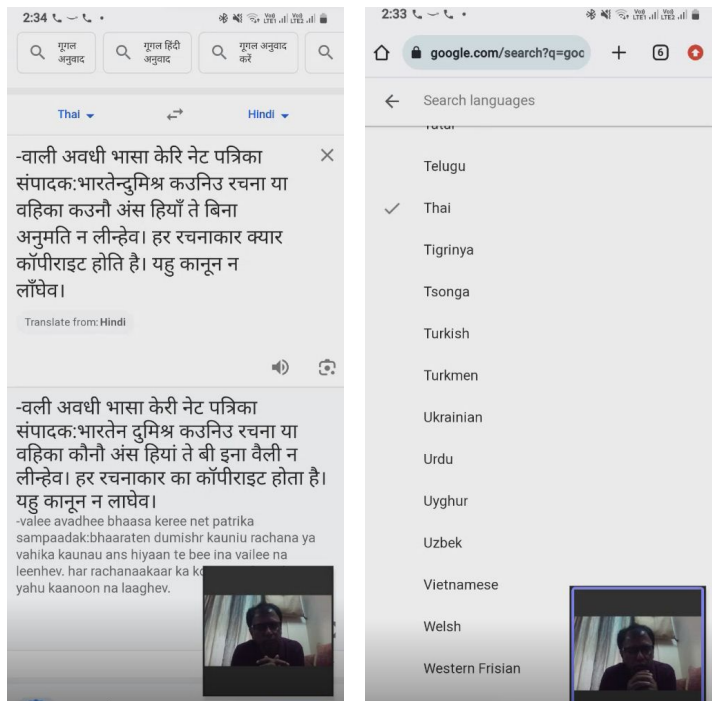
*When there are Sanskrit words like ‘Chaupai’.
The ones where I need to get the exact Hindi meaning or
English translation.*

*So, I am just copying it and I am just going to Google
Translate. First, I will use that. I will convert it from Hindi to
English.”*

(P27 - Monolingual Reader)



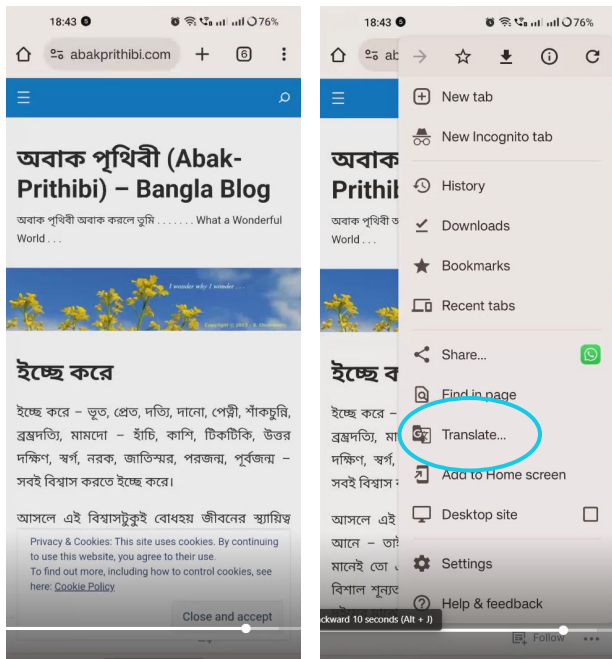
Translating Hindi Dialects



Participants who recognize the content as Awadhi, find that this language is not supported on Google Translate.

Opportunity - Translation support for regional languages and dialects.

Translating an entire web page



Workflow 9

Select 'Translate' on Google overflow menu to translate all content on a web page.

Some readers discover and use the **Google overflow menu** to translate web pages in an unfamiliar language.

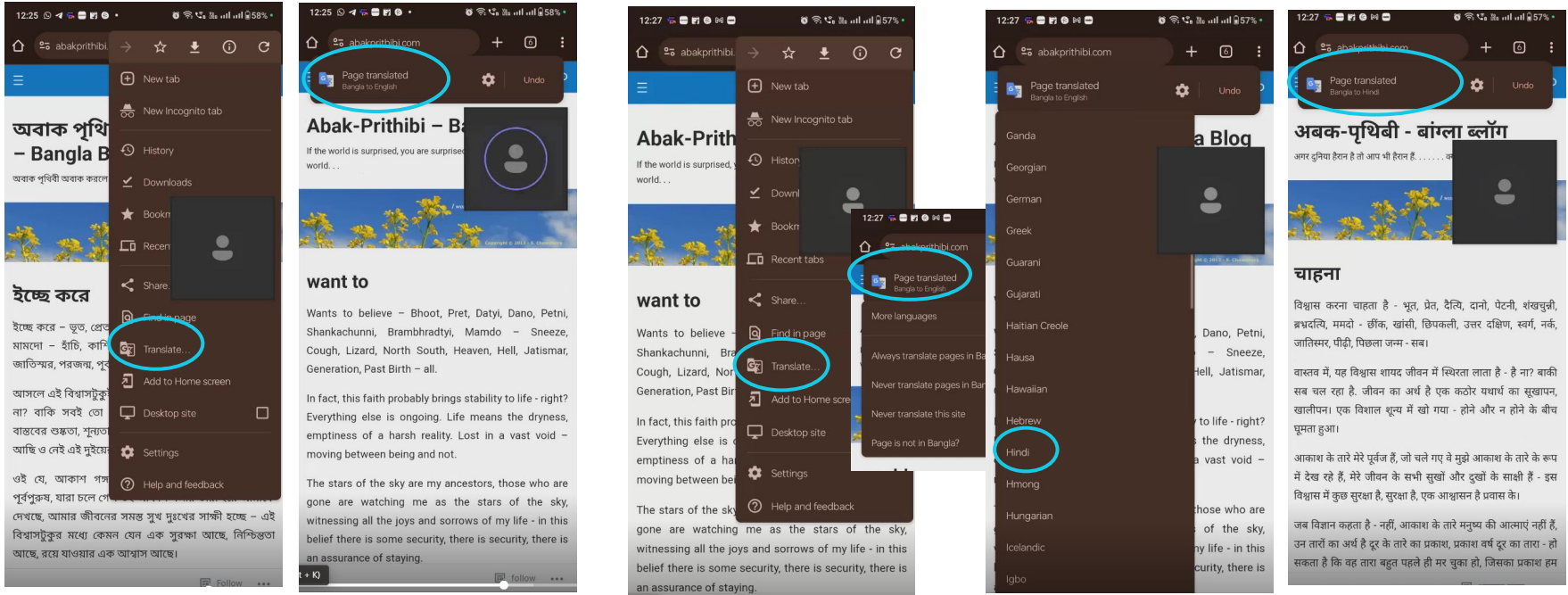
Workflow 10

Translate (Bangla > English) > Translate > More Languages (Bangla > Hindi)

A reader opted to translate the web page in an unfamiliar language into both Hindi and English, in order to compare translation quality.

Pain Point - The overflow menu is not discovered by all participants who want to translate the entire web page content. (The persistent footer (also used for the same purpose) has comparatively better discoverability.)

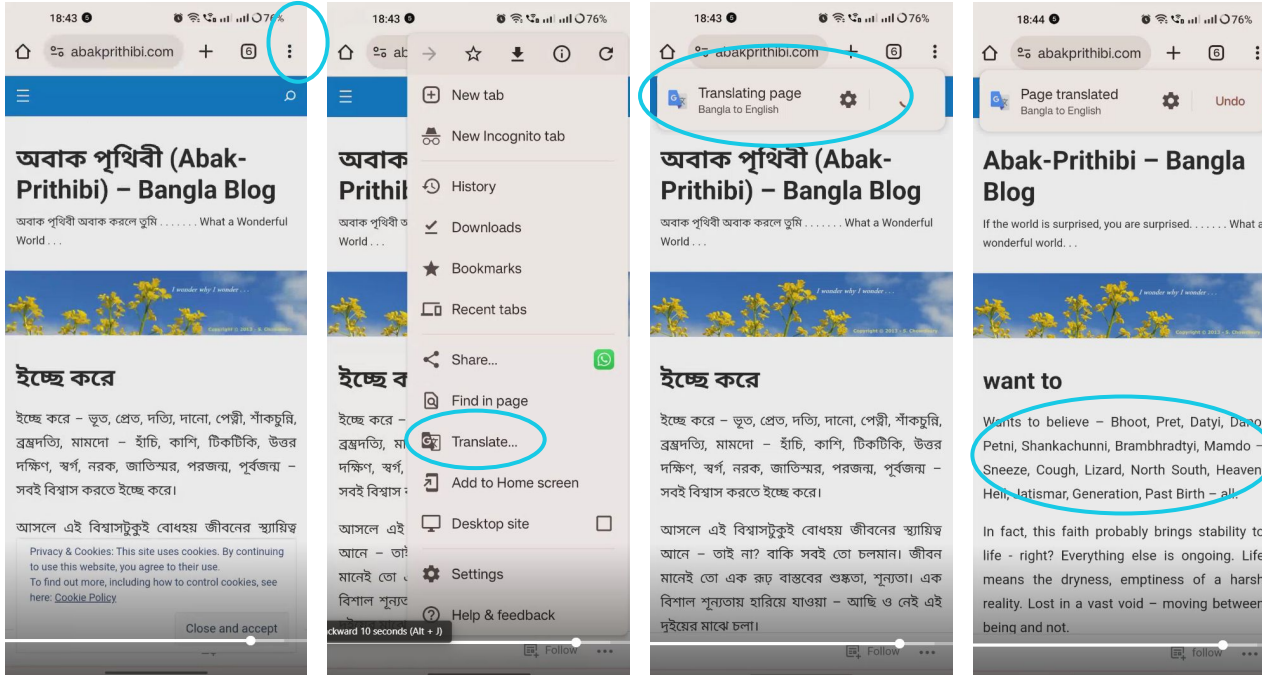
Translating an entire web page



P-35 Monolingual Reader opted to translate the web page in an unfamiliar language into both Hindi and English, in order to compare translation quality. On comparison, the reader concluded that the Hindi translation was more accurate, while the English translation was 'literal' and '*not in continuity'

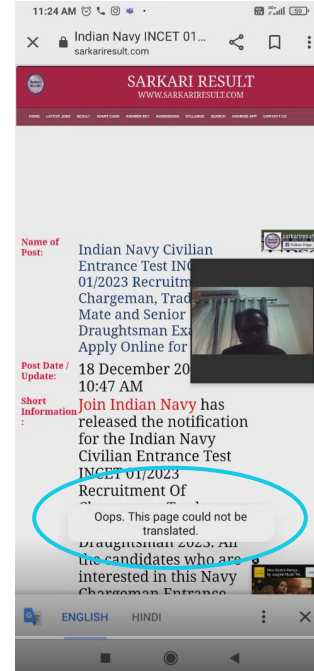
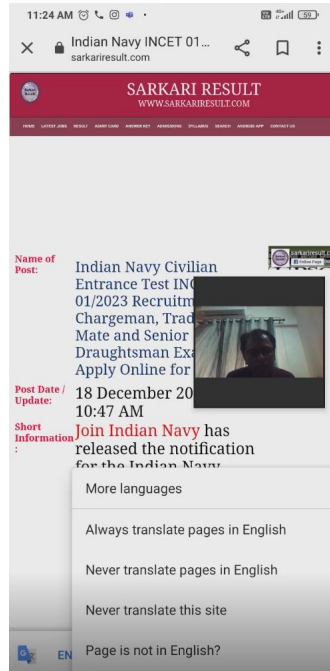
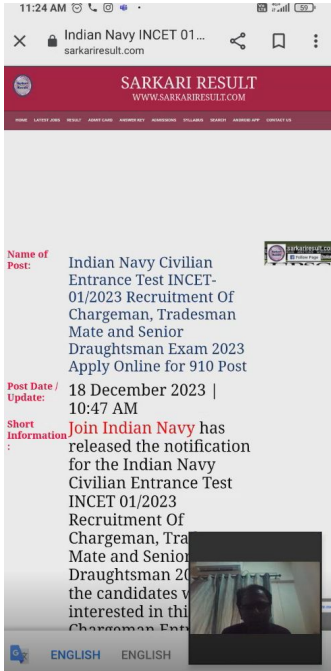
Opportunity - System recommendations on most effective language pairs for translation.

Translating an entire web page



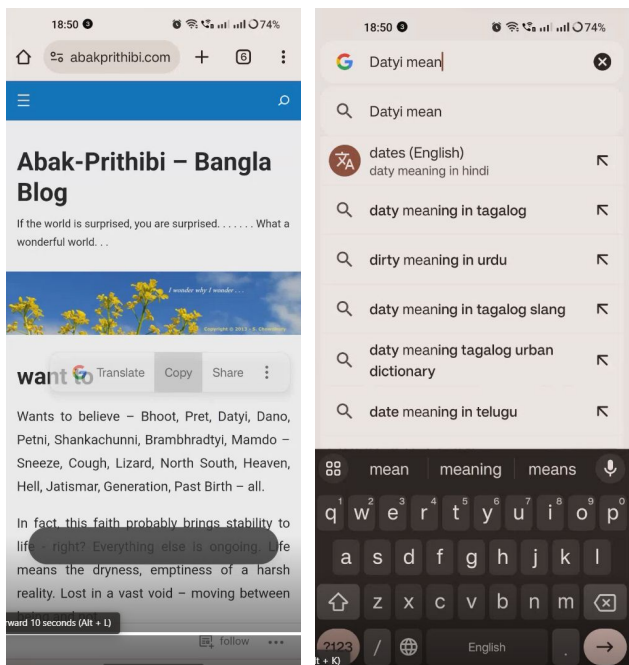
Pain Point - When translating an entire web page, content is sometimes partially translated / not translated.

Translating an entire web page



Opportunity - Reliable service to translate an entire web page. (When translating an entire web page, content is sometimes partially translated / not translated.)

Translating untranslated words



Workflow 11

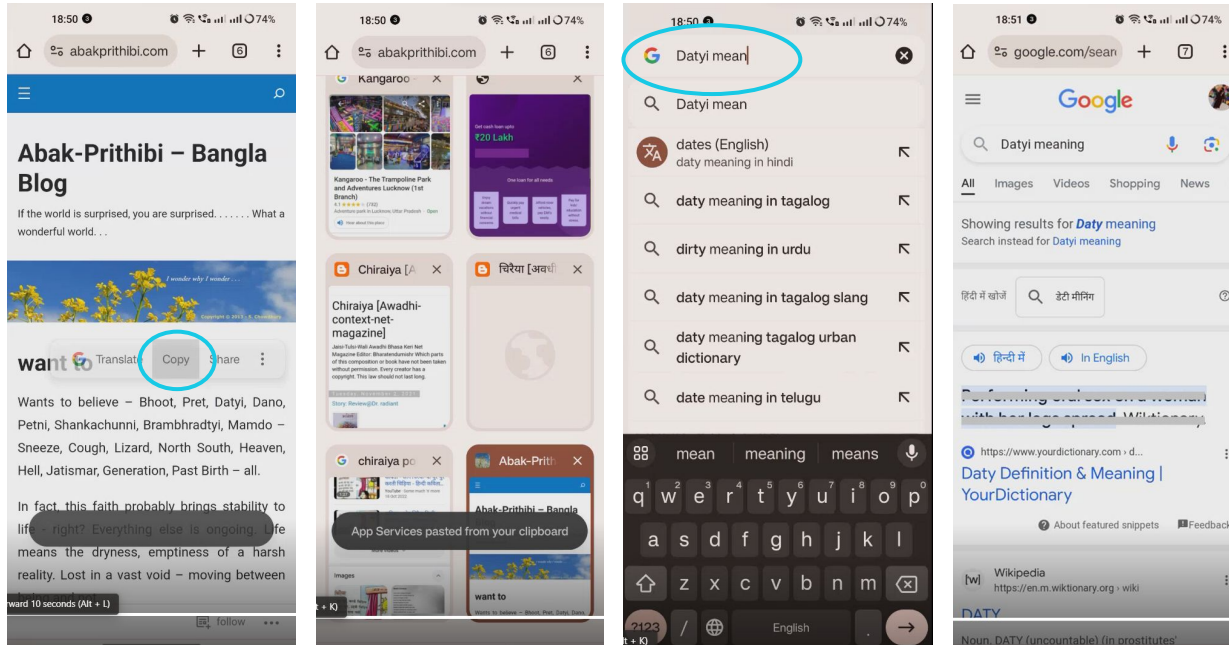
Copy untranslated word > Paste into Google omnibox > Error > Search Results (Online Dictionary)

A participant attempted to ‘translate the translation’ on Google.

After two unsuccessful attempts, she was able to find the meaning through an online dictionary in Google search results.

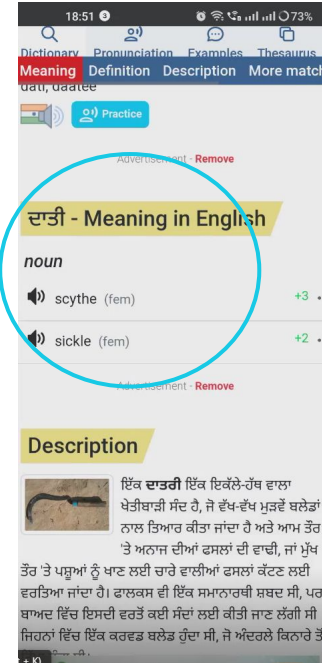
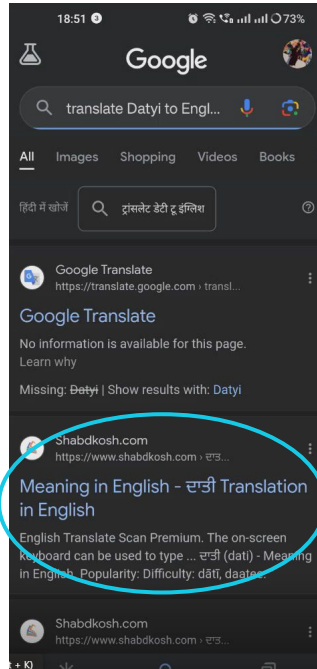
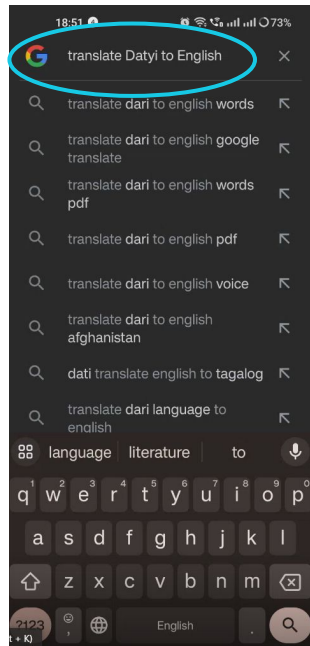
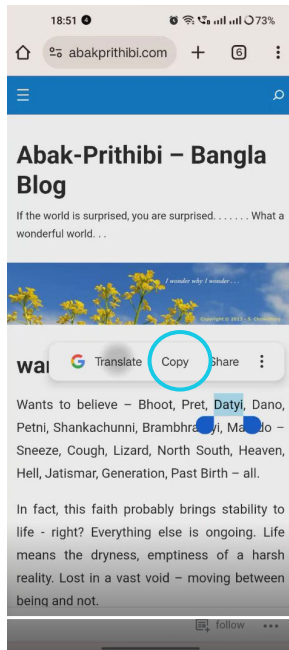
Opportunity - Provision of additional dictionary resources for untranslated content could better support the translation experience.

Translating untranslated words



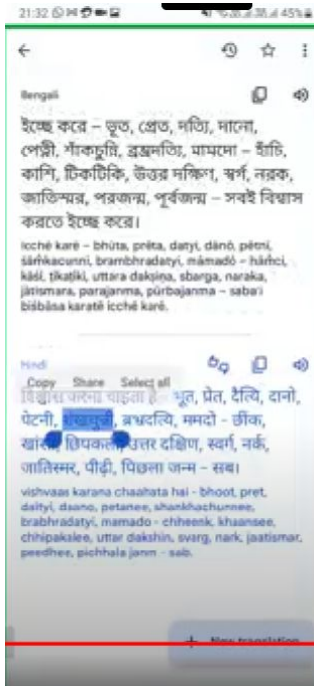
***Attempt 1** - P-28 Monolingual Reader first attempts to find the meaning of an untranslated word by copying and pasting the word into Google omnibox. As the source language was not specified in the query, this results in an inappropriate / unexpected search result.*

Translating untranslated words



Attempt 2 - P-28 Monolingual Reader reattempts translating the word using a different query, but is unsuccessful as the source language is not specified again. At this point, she notices an online dictionary in the search result, and clicks in to find the meaning.

Deciphering 'difficult' words in the translation



Workflow 12

Copy content from web page > Paste into Google Translate > Copy 'difficult' word > Search on Google

At times, words in the translated text are difficult for readers to understand, in spite of it being in the preferred language.

Readers currently need to leave the translation and go to Google to search for the meaning of difficult terms.

Opportunity - An option to quickly check synonyms for difficult/complicated words in the translated text could help readers to understand the translated text more easily.

Difficult to understand words in the (Hindi) translation

*“One word can have many meanings.
There are some words that we can't understand easily.
Even in Hindi we can't understand sometimes.*

*So when that is highlighted and when we click on it, then the
other meanings (synonyms) can be displayed to improve our
understanding.”*

(P26 - Monolingual Reader)



Translating an entire web page



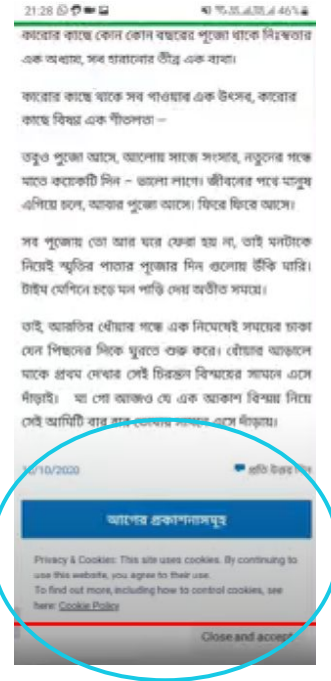
Workflow 13

Select language on the persistent footer to translate all content on a web page.

Some readers discover and use the **persistent footer** to translate web pages in an unfamiliar language.

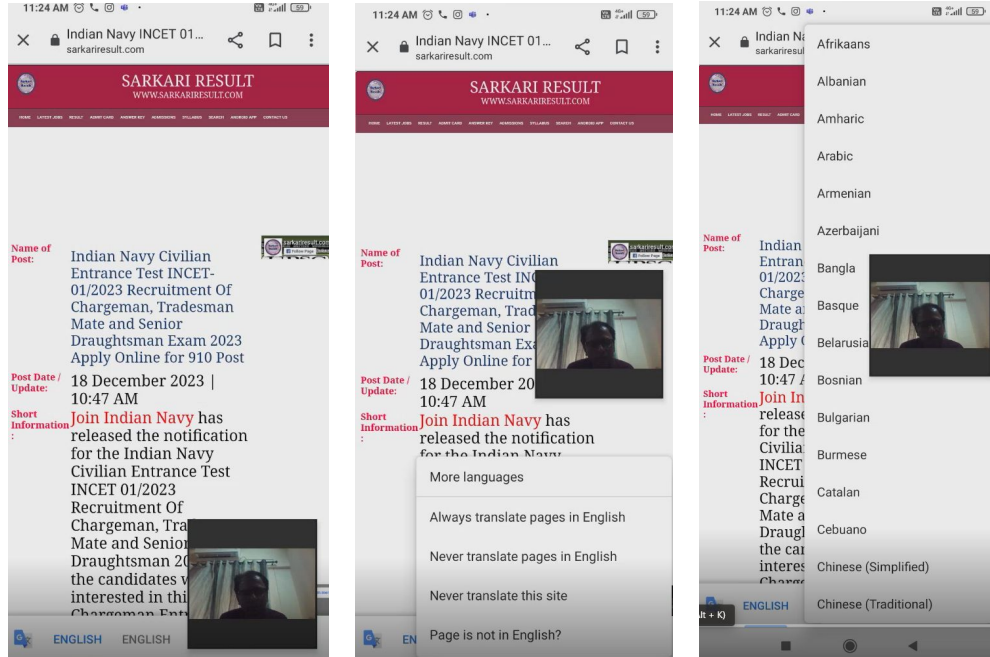
Pain Point - Usage of the persistent footer is not self evident / The footer has low visibility and is overlooked by some readers. A reader notes that scrolling to find and select a language is also tedious.

Translating an entire web page



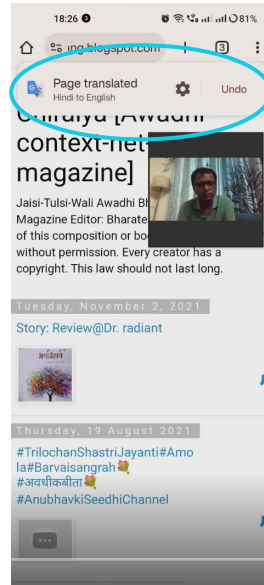
It is not evident to all readers that that 3 dots can be used to change source / translation language - Some assume that only the displayed languages are available for translation. In some cases, pop-up messages from the website overshadows the persistent translation footer and it is overlooked. While scrolling, the pop-up cookie message remains, but translation options disappear completely.

Translating an entire web page



P-31 Monolingual Reader takes time locating the 'More Languages' option on the persistent footer. Even on discovering the pop up option, he selects the wrong option ('Never translate pages') as his English skills are limited, and he finds it hard to understand the options written in English. He also notes that scrolling to select the 'translate to' language is tedious.

Translating an entire web page

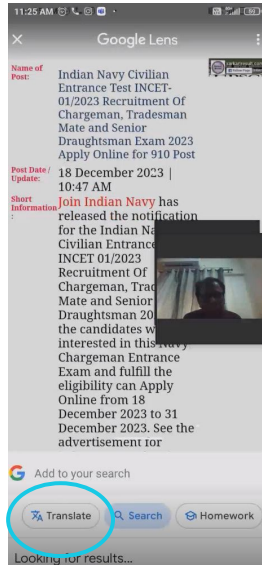


Workflow 14

Automatic detection and translation of non-preferred language to preferred language

Upon opening a website in a non-preferred language, P-28 Monolingual Reader's phone automatically detects and translates the content to the default language on her phone.

Translating lengthy text / an entire web page



Workflow 15

Screen Capture > Google Lens Popup > Translate

Workflow 16

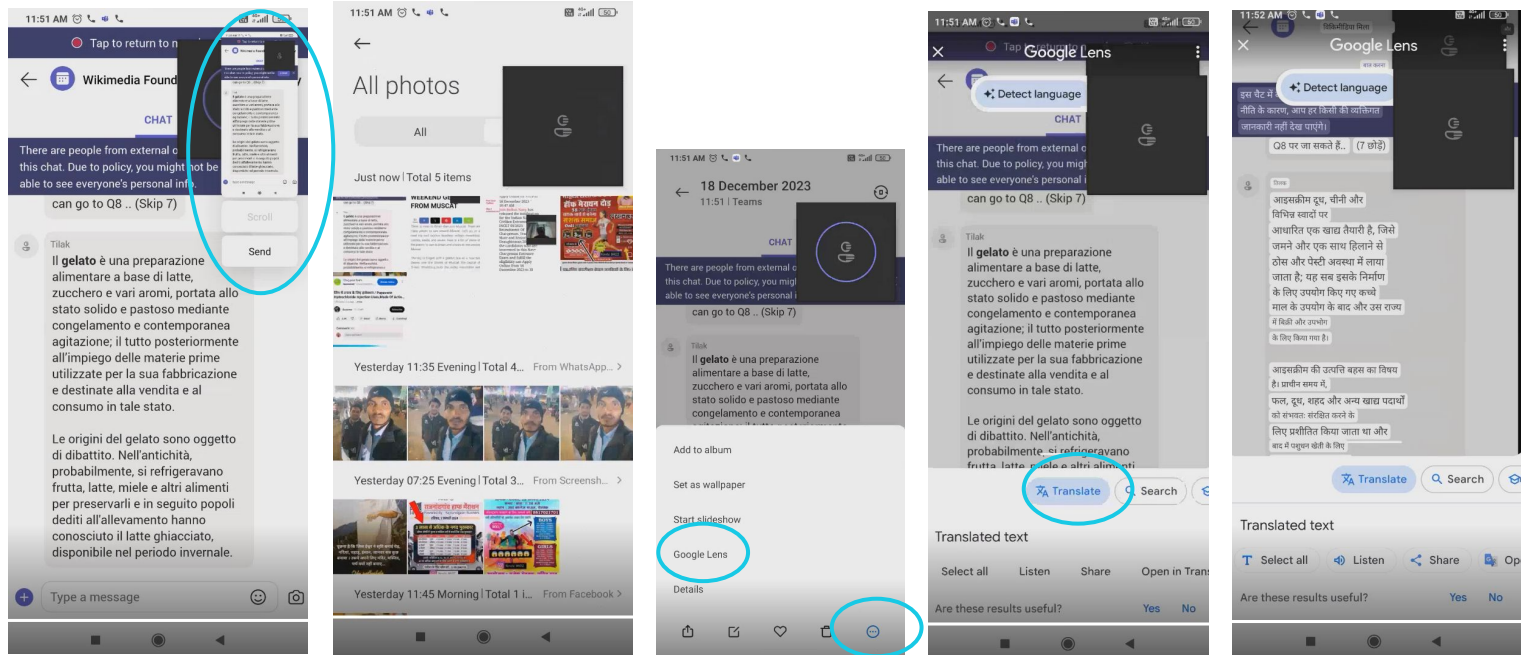
Screen Capture > (Miss clicking on Google Lens popup) > Phone Pictures > Locate and Open Image > Google Lens > Translate

Google Lens is another way by which readers attempt to translate lengthy content.

While this is the default method for some, others revert to this after encountering errors when attempting to translate lengthy text through other Google entry points.

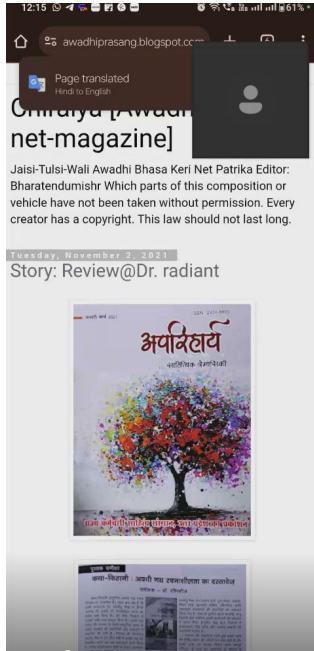
Pain Point - The Google Lens popup which appears after capturing a screenshot, is transitory and readers often miss clicking on it before it disappears. Clicking into phone pictures to retrieve the image for translation adds to task time. Readers also note that - it is harder to read text on a translation done this way; Translation of *formatted text can be inaccurate / garbled.

Translating lengthy text / an entire web page



P-31 Monolingual Reader takes a screen grab of text in an unfamiliar language received over chat. Having missed clicking on Google Lens before it disappears, he has to go into phone pictures to retrieve the image for translation.

Translating lengthy text / an entire web page



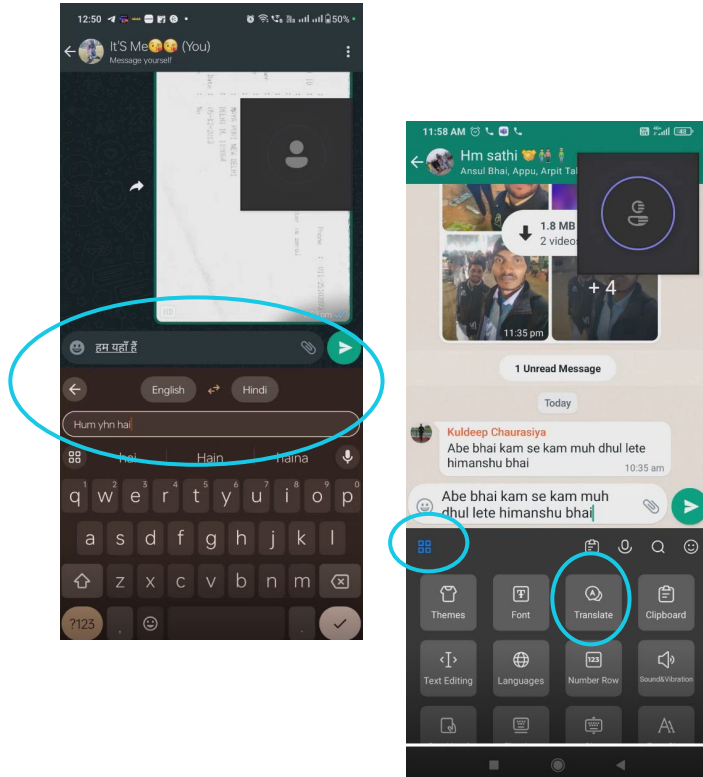
P-35 Monolingual Reader is unsure how to translate text on a photograph or protected documents.



P-33 Monolingual Reader has seen her children use Google Lens for translation, but has never attempted or learnt how to do this on her own.

Pain Point - This method of translation is not easily discoverable, and some readers remain unaware of it. It can also come across as 'technical' and this perception can potentially dissuade usage.

Translation for communication



Workflow 17 (Sending a message)

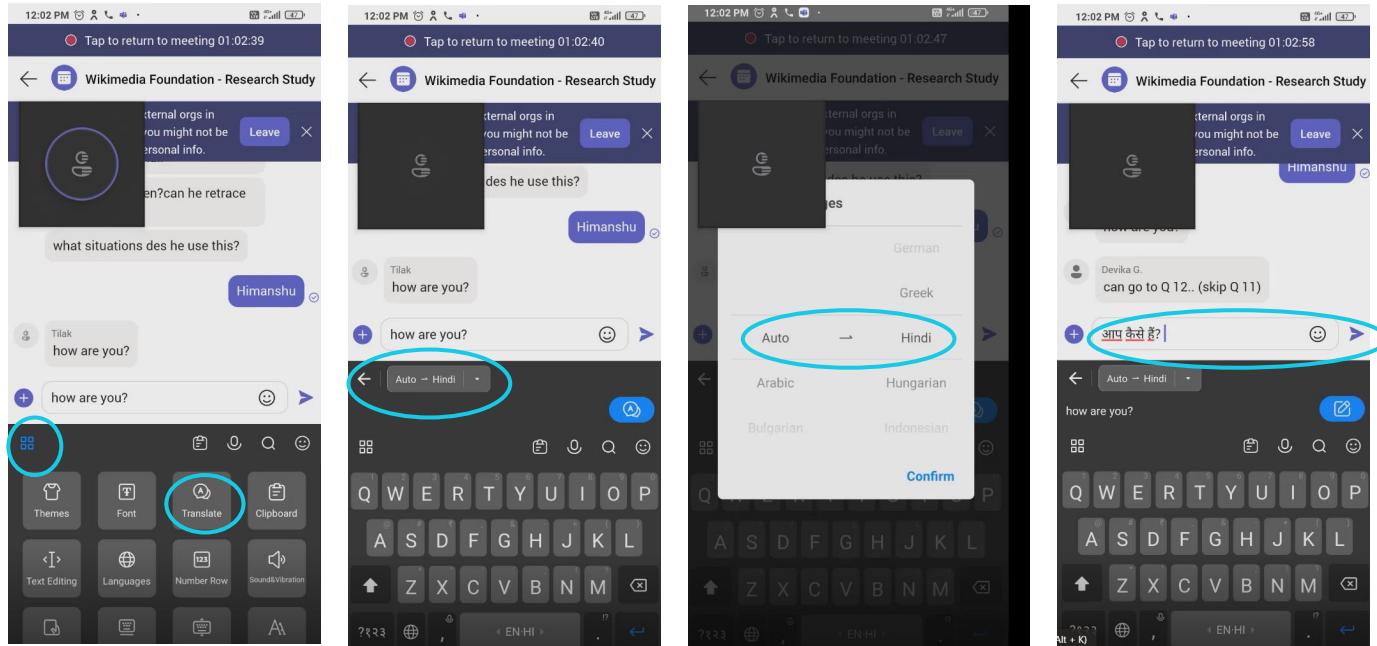
Type into the translation text box > Gboard menu icon > Translate > Select source and/or output language (if needed) > Send

Workflow 18 (Reading a message)

Toggle function: 'Translate To' <> 'Show Original'

Those who have Gboard installed on their device, have access to translation while using apps / websites that require text input, like WhatsApp / Teams Chat / Quora.

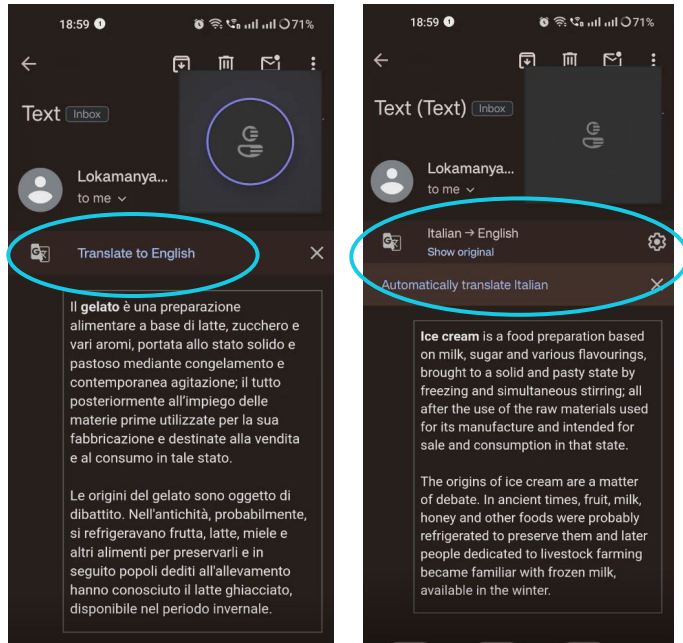
Translation for communication



Workflow 17 (Sending a message) - Translating content to be sent in a language that is different from the originally typed language

(Type into the translation text box > Gboard menu icon > Translate > Select source and/or output language (if needed) > Send)

Translation for communication



Workflow 18 (Reading a message) - Translation prompt to translate content received in a language that is not the preferred language / default language set on the phone.

(Toggle function: 'Translate To' <> 'Show Original')

Apple Translation Experience

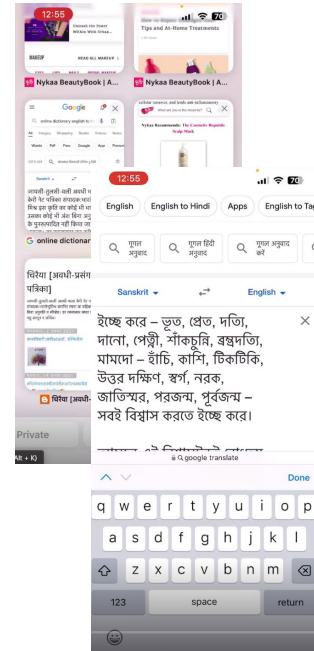
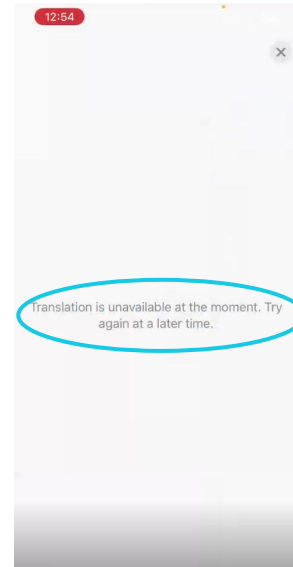
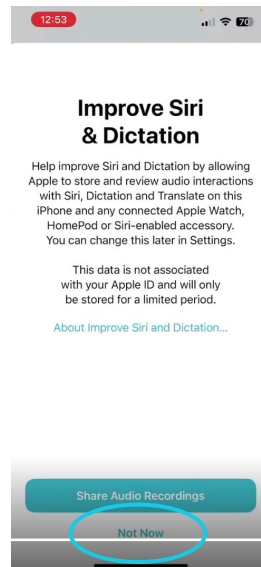
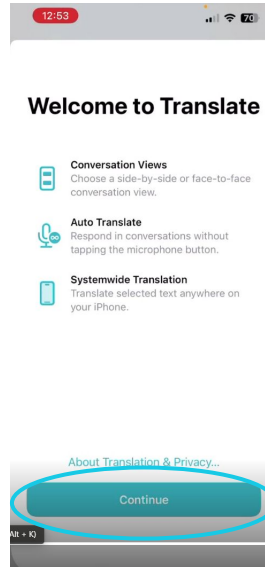
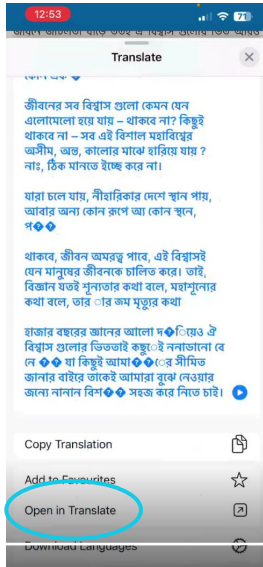
The translation experience on the iPhone is not as seamless as on Google.

While the translation workflow starts on Apple, the reader is eventually compelled to divert to Google.

Limitations encountered on Apple, result in errors and dead ends.

Translating Lengthier Text

Apple Translation Workflow (Continued) - 'Open in Translate' (In an attempt to generate a better translation) > (workflow goes into a loop and culminates at a dead end) > Switches screens to use Google Translate



‘Low Exposure Users’ Translation Experience

This section of the report documents the translation workflows of two ‘*low exposure users’.

Including this perspective, intends to broaden the understanding about the translation experience, by:

- Challenging assumptions about self evidence and user expectations.
- Reinforcing barriers encountered in the translation workflow.

Simpler and more efficient translation features could benefit ‘low exposure users’, as well as the wider group of readers.

'Low Exposure Users' are not 'low tech' or 'new-to-net' users:

- *They regularly and independently engage with the Internet, in their daily lives.*
- *The Internet is utilized beyond basic communication and entertainment.*

However:

- *Their Internet usage is task-oriented rather than exploratory - Focussing on specific objectives.*
'Help kids with homework' / 'Share information with students' / 'Read the news' / 'Find a recipe' / 'Order Food'
- *Their digital awareness and exposure is limited to a narrow set of digital services.*

It is conjectured that several factors could potentially contribute to limited exposure:

- *Age*
Older individuals who did not grow up with technology/internet as an integral part of their lives
- *Limited access of technology/internet*
Due to financial constraints or geographical location
- *Limited formal education*
- *Linguistic barriers*
- *Nature of work/daily habits*
Situations where extensive technology/internet usage is not necessary or permitted



P-29 Monolingual Reader

- Lives in Delhi
- 26-34 years old
- High school mathematics teacher
- Native Hindi speaker
- Knows some English and Bhojpuri

- Internet usage - Daily; 20+ hrs/week
- Reads news and teaching-related content online
- Phone apps - Instagram, Music, Food Delivery, Games, File Transfer, Digital Payments, Android Tips and Tricks, Voice Recorder, Fantasy Sports, Education

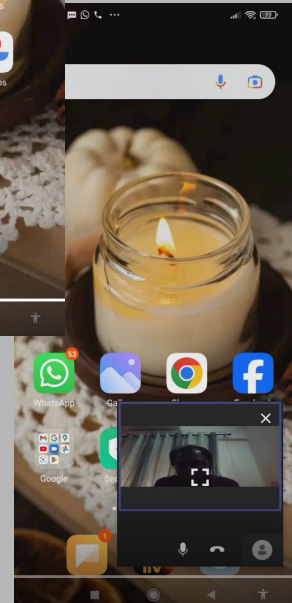
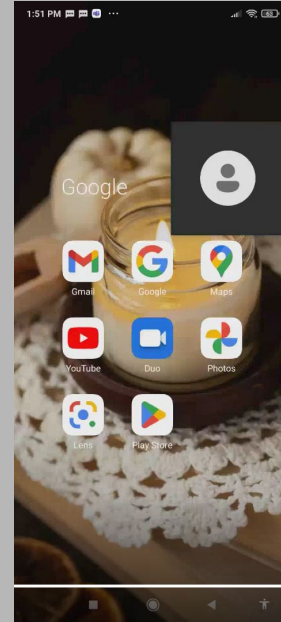




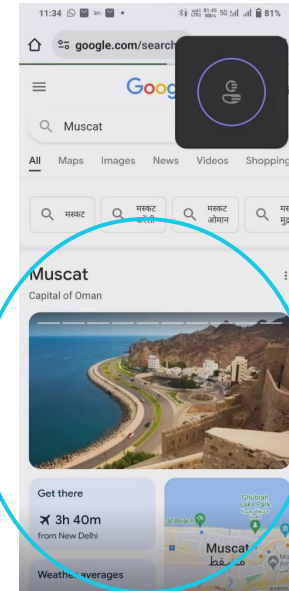
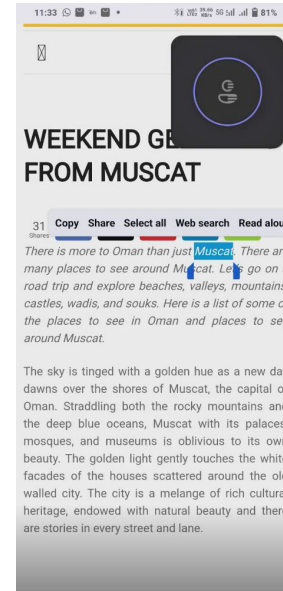
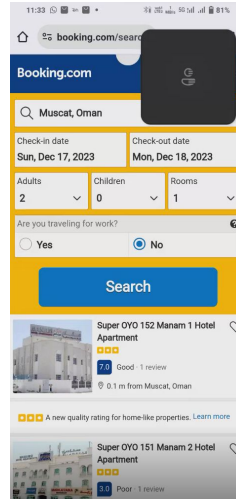
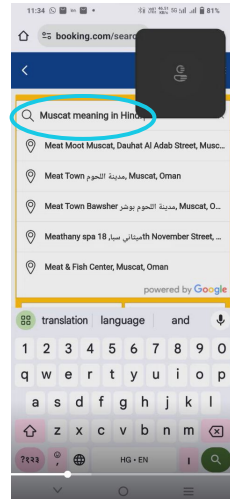
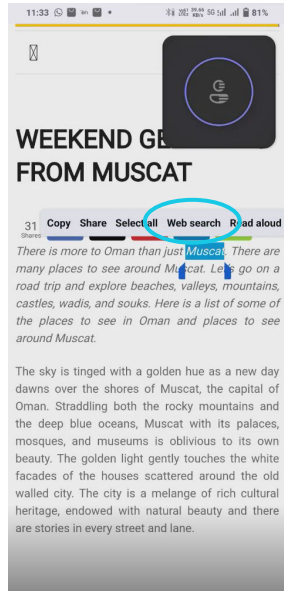
P-32 Monolingual Reader

- Lives in Delhi
- 35-50 years old
- Homemaker
- Graduate
- Native Hindi speaker
- Knows some English

- Internet usage - Daily; 10-20 hrs/week
- Uses a smartphone, but not a laptop
- Reads news, recipes and health related content online
- Phone apps - Google (YouTube, Search, Maps, Gmail etc.), Facebook, WhatsApp



Low Exposure User 1 (Workflow 1)

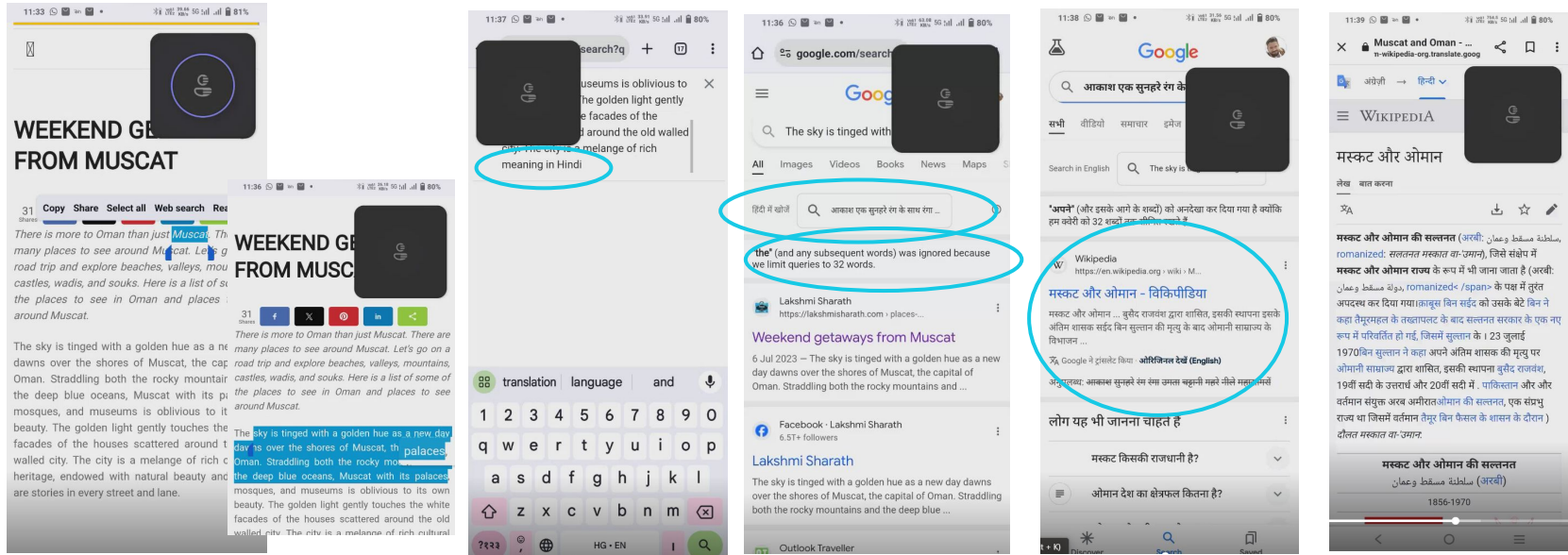


1. P-29 Monolingual Reader does not differentiate between 'Web Search' and 'Translation'
- 'Web Search' is identified as a way to find the meaning of an unfamiliar term.

2. The 'Search' option on *Booking.com is mistaken for 'Google Search'
- He attempts to search for the meaning of Muscat in Hindi. The results inform him that it is the name of a place.

3. Doing a 'Web Search' again, takes him to Google
- He scans Google search results to get more context about Muscat.
This is considered a successful task completion.

Low Exposure User 1 (Workflow 2)



1. **P-29 Monolingual Reader** – Copy-pastes the paragraph to be translated into Google omnibox, and adds 'meaning in Hindi' at the end of the paragraph to indicate it is a translation query. Copy-pasting lengthier text into Google search, results in a word-limit error, which is overlooked. The search results are considered an acceptable end point, but he is confused why he got the entire article (in English) again.



2. Clicks on 'Search in Hindi' - And gets the search results in Hindi.. Clicks into the 1st result (Wikipedia) - This is considered a successful task completion. It doesn't matter that it's not a translation of the original article - Search results are considered to be 'additional information about the topic.'

“And after that, they have also written that ‘people also want to know this’.

So it is done, right?

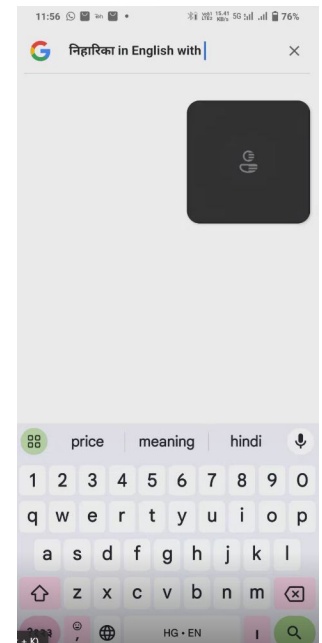
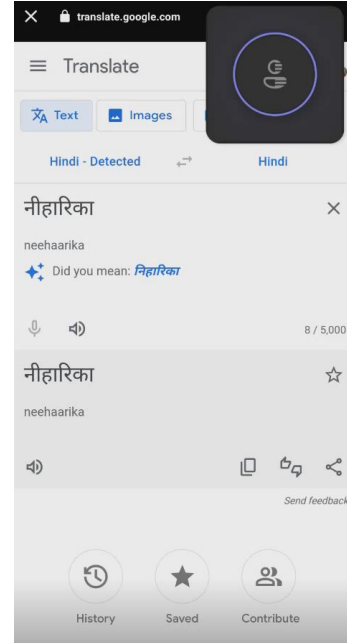
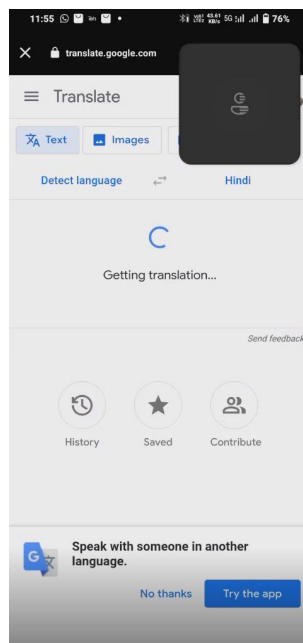
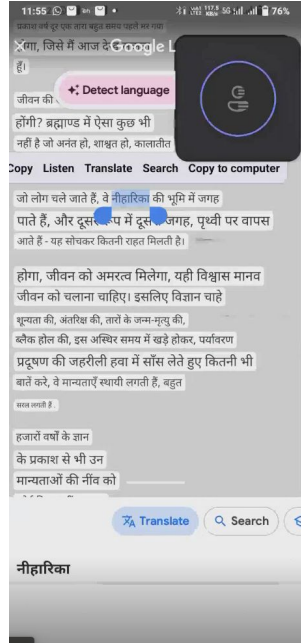
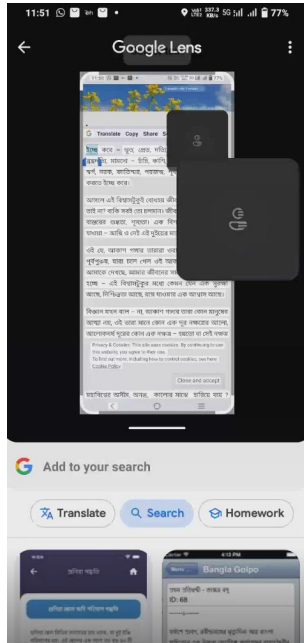
And after that, they have given more data about it - Like how big it is, how wide it is...

That is, even the extra information is given below on the website automatically, in case you want more information about it, you can get that data also.”

(P29 - Monolingual Reader)



Low Exposure User 1 (Workflow 3)



1. **P-29 Monolingual Reader** – Takes a screenshot to translate content. (Via Google Lens)
Unable to understand a Hindi word in the translated content, he copies it to find the English translation through Google.

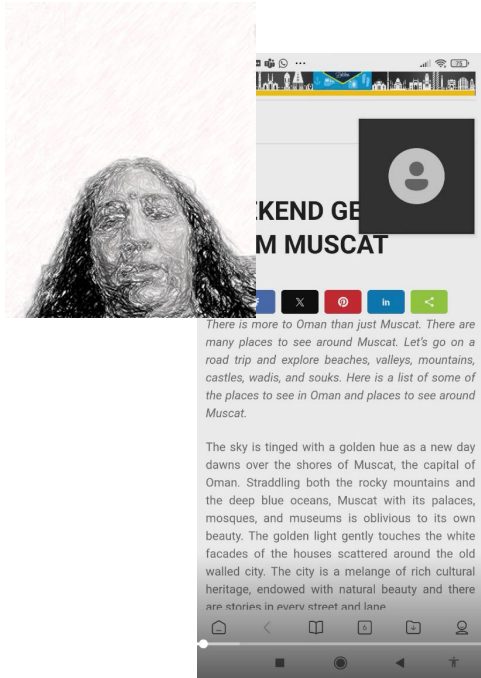


2. Although the system detects the language as 'Hindi', the output language is auto selected as 'Hindi' by default.
The reader doesn't notice this, and is unsure why the word is 'not translated'



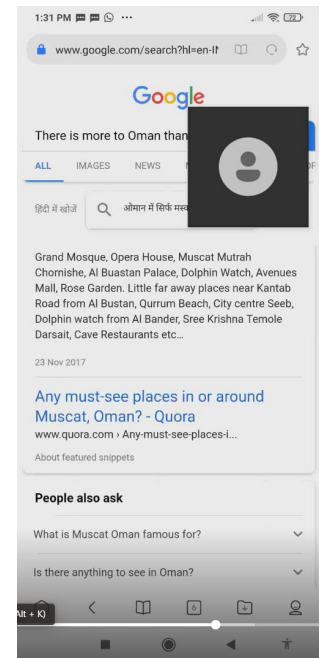
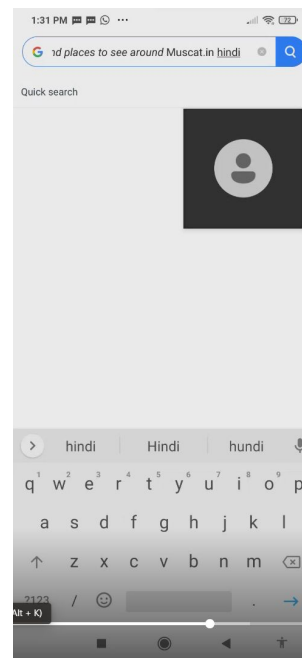
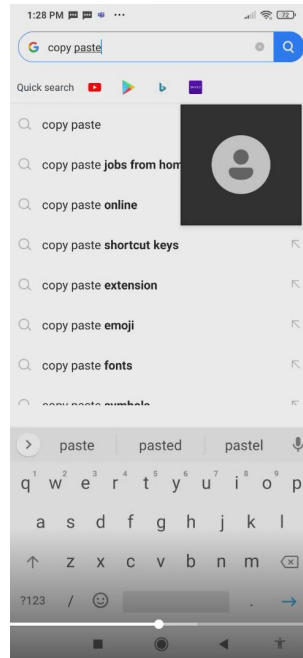
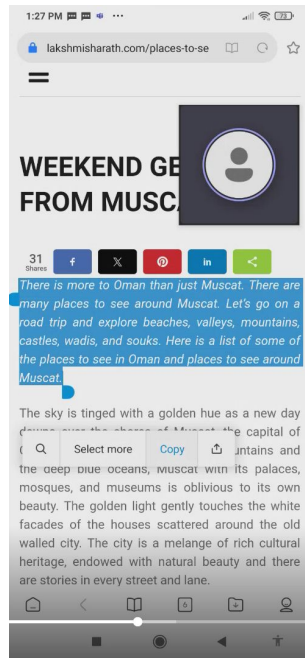
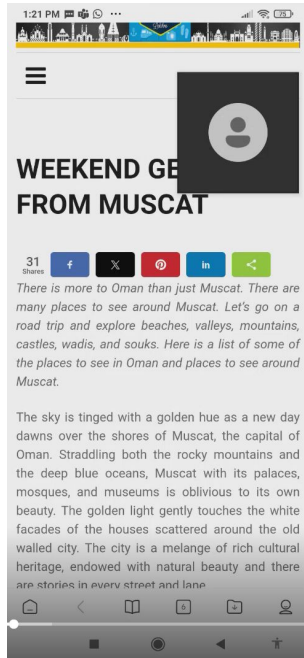
3. He then copy-pastes the Hindi word into Google ('Niharika in English with examples')

Low Exposure User 2



Translating lengthier content is an atypical situation for P-32 Monolingual Reader. She is always able to find articles in Hindi by typing out '(topic of interest) in Hindi' and doesn't find herself in situations where she needs to translate long form content. She typically translates only words rather than lengthier text.

Low Exposure User 2 (Workflow 4)



1. P-32 Monolingual Reader is unfamiliar with the social media icons on top, and speculates that 'in' (LinkedIn) could be a translation option.

Moderator prompts her to 'copy' some text and see if she can translate after that. She is able to copy text, but is unsure what to do next.



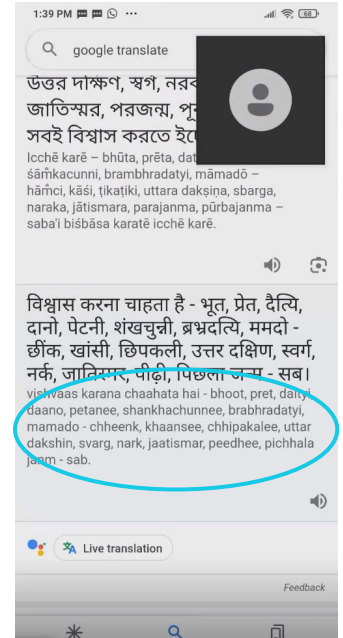
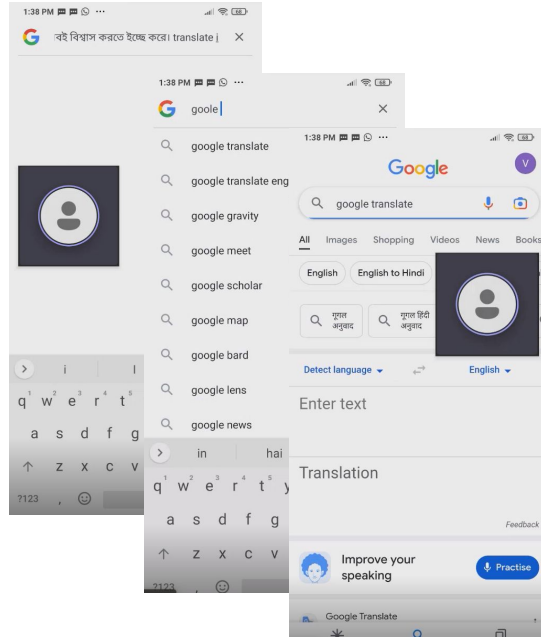
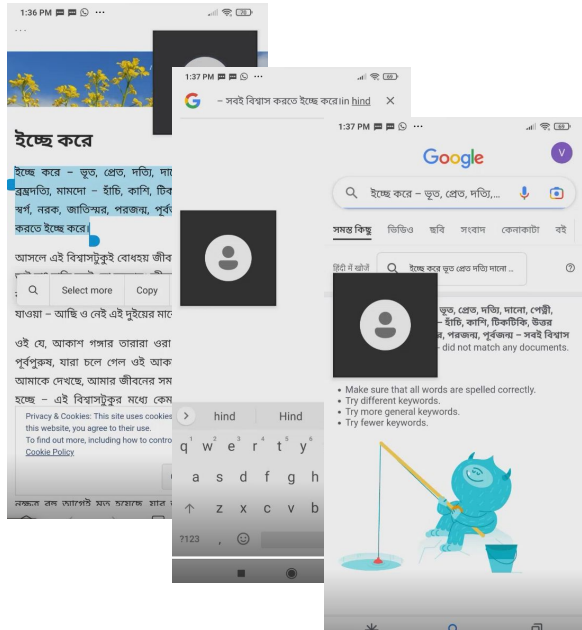
2. On being prompted to copy-paste the text into the Google omnibox, she types out 'copy paste'

After some help from the moderator, she copy-pastes the sentence into the omnibox, and adds 'in Hindi' at the end.



3. This results in search results instead of a translation. However, this is considered a successful task completion, as it gives her 'more information.'

Low Exposure User 2 (Workflow 5)



1. P-32 Monolingual Reader attempts to translate the Bengali blog by recalling the moderators instructions from the previous task.

She gets a word-limit error and is unsure how to proceed.



2. Is guided by the moderator to type 'Google Translate' into Google omnibox.

She needs to be handheld through the process.



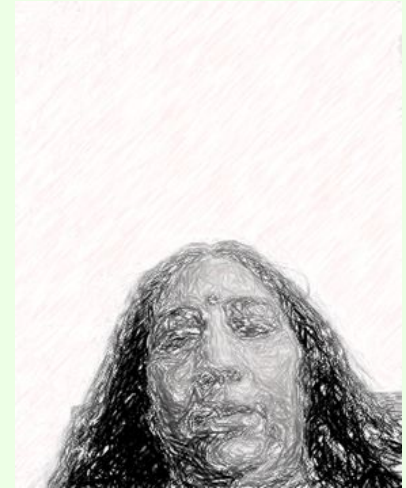
3. Struggles and notes that the process is difficult and lengthy.

She appreciates the transliterated Hindi text, as she is not a fluent Hindi reader.

*“Frankly speaking, I found it a bit difficult for the first time.
As of now, you have guided me.
If I continue to do it, I feel this is quite helpful for me in the
future.*

*But I found it lengthy the first time.
I might not go for it if I find the process is lengthy.”*

(P32 - Monolingual Reader)



Pain Points (Summary)

Observing monolingual readers attempt translation tasks in context to different goals provided an evaluative assessment of Google and Apple machine translation solutions.

Pain points encountered by study participants, along with corresponding opportunities for a better translation experience are summarized over the next few slides.

	Pain Points	Opportunities
	<p><i>Translation is used to comprehend a range of information depths - individual words, phrases, paragraphs or longer form content.</i></p> <p><i>While Google offers multiple translation UI's - The correlation between different translation solutions and information depth is not explicit.</i></p> <p><i>Reader selection of translation solutions to be used, is based on familiarity/habit rather than suitability to information depth, and this results in poor experience.</i></p> <p><i>Moreover, research highlights additional pain points linked to translation at different information depths, that were encountered by participants.</i></p>	
1.	<p>Translating Lengthier Text</p> <ul style="list-style-type: none"> - Word-limit error - Difficulty selecting only text and not other page components on a webpage. - Partially translated / Untranslated content - Error messaging that are low visibility / Not sufficiently informative 	<ul style="list-style-type: none"> ● Better translation support for lengthier text ● Effective error handling
2.	<p>Understanding 'difficult' words while reading content online</p> <ul style="list-style-type: none"> - Existing translation solutions feel elaborate and possibly disrupt the reading flow when the goal is to merely grasp the meaning of isolated words or phrases. 	<ul style="list-style-type: none"> ● Non-disruptive workflow to support single word translation

Translate whole documents

Save time and effort by translating an entire document with one click.

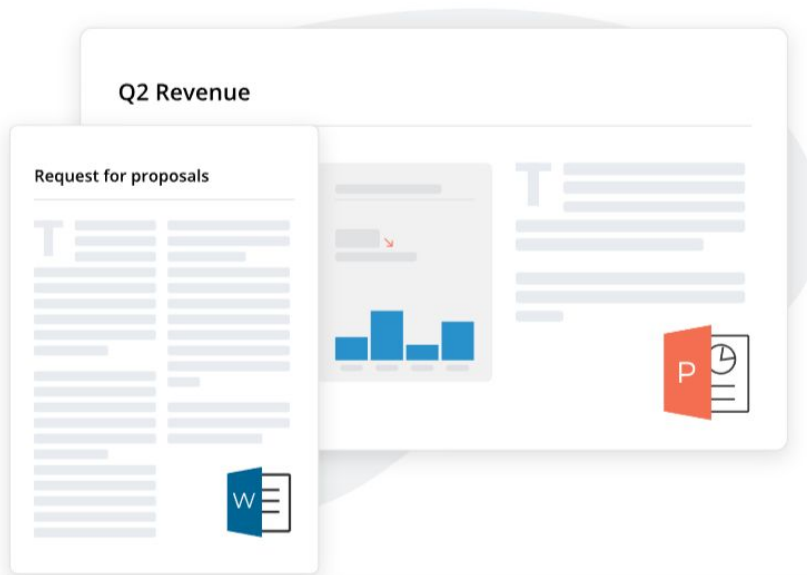
Translate PDF, Word, and PowerPoint files

All translated documents maintain their original formatting. With DeepL Pro, you can also edit translated documents, as well as [translate larger files](#) and [more file types](#).

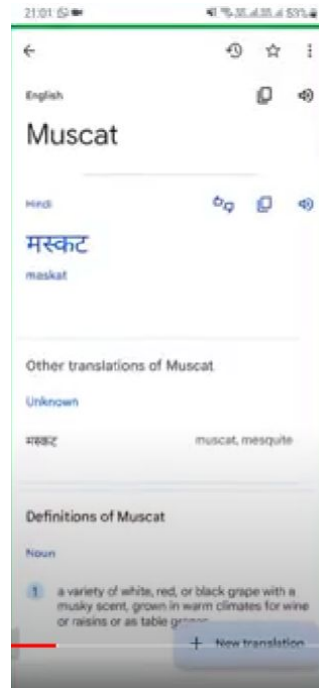
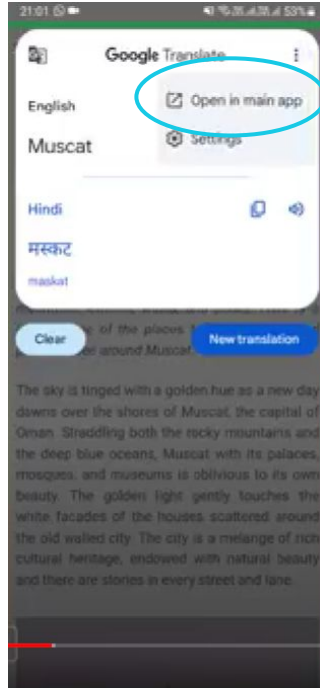
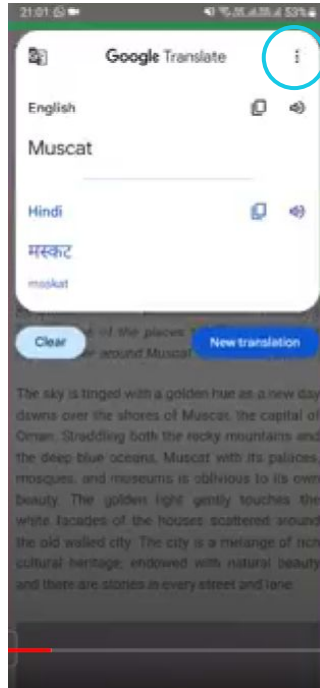
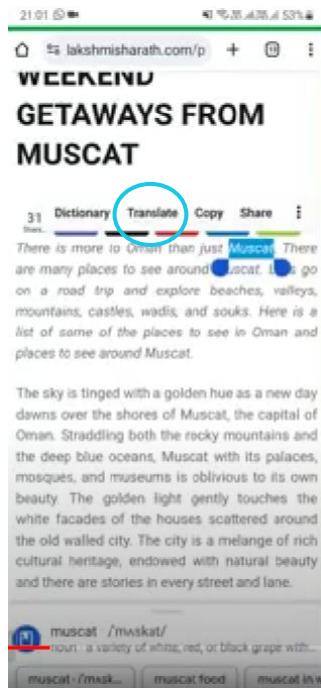
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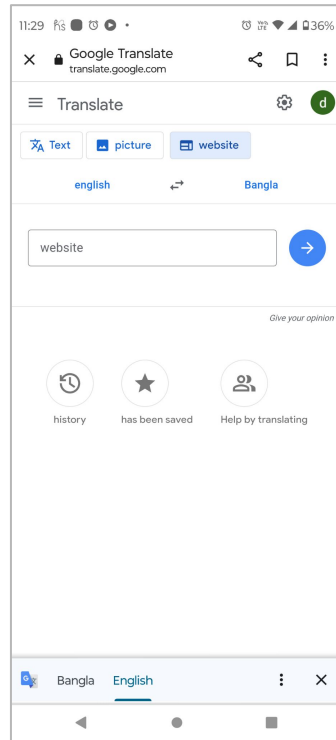
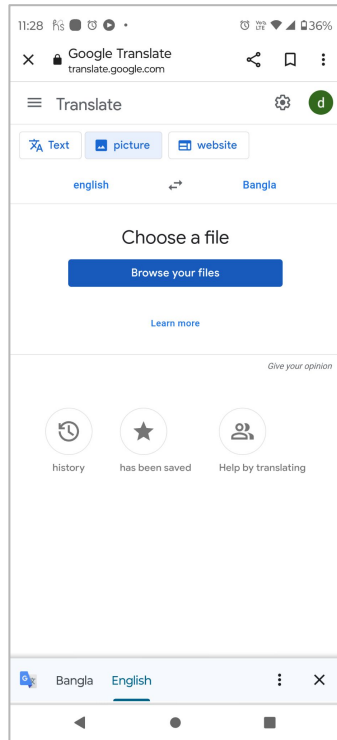
[Compare plans](#) →



Translation support for lengthier content - The translation service [DeepL](#) addresses the need to translate lengthier content formats. However, HTML is currently not supported.



Translating a word - Participants find the workflow for word translation while reading online content or while reading translated text inefficient. The exception was P-26 Monolingual reader who encountered a streamlined workflow that was appreciated as 'time-saving.'



Translation support for different source formats - Google Translate has a UI update that differentiates between source formats for translation. Study participants however, did not encounter this UI.

	Pain Points	Opportunities
3.	System detection of Hindi dialects as Hindi / System selection of closest supported language as source language / Incorrect language detection	<ul style="list-style-type: none"> ● Improved accuracy in language detection ● Translation support for *dialects, regional Indian languages and Hinglish
4.	Incorrect language selection by readers is undetected by the system	<ul style="list-style-type: none"> ● Error prevention measures to proactively mitigate error-prone conditions
5.	Understanding 'difficult' words in the translated text	<ul style="list-style-type: none"> ● **Additional dictionary support for translated content

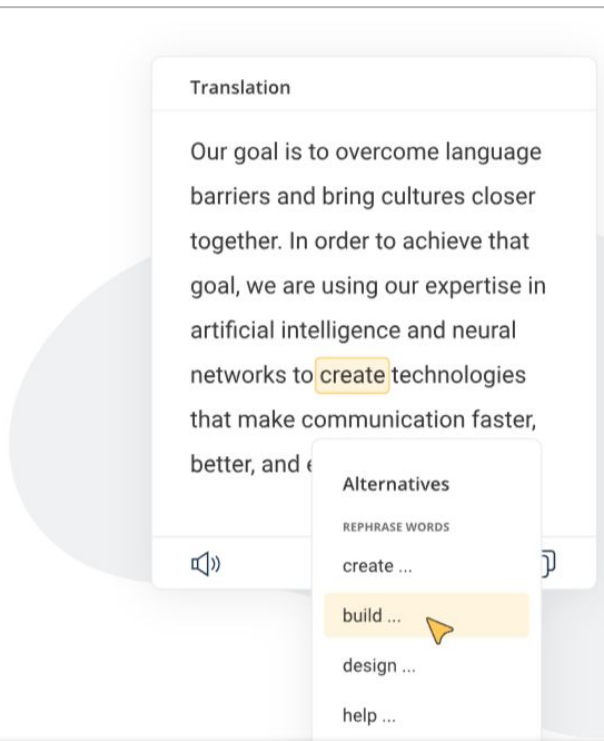
Select alternative words or phrases

Alternative translations save you the time of searching for a different word or phrase for your translation. Simply click on a word, choose between the alternative options, and the surrounding text will be automatically adjusted. It's that simple.

FEATURE INCLUDED IN

ALL PLANS

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Additional dictionary support for translated content - The translation service [DeepL](#) has an 'alternate word / phrase' feature intended to allow editors to 'adjust' the translation to better suit the context.

A similar option where dictionary support for translated content is available, can support readers. For example, synonym suggestions for difficult words could help readers understand translated content more easily.

Value (Summary)

Studying the translation workflows of monolingual readers also highlighted the features and aspects of translation solutions that readers find valuable.

These findings offer valuable insights for future iterations of MinT and are summarized over the next few slides.

Value

At a fundamental level, readers are grateful to have access to online translation services.

A convenience that was not accessible a few years ago, translation services have made it possible to easily and independently understand content in unfamiliar languages.

Individual readers specifically appreciated:

- Auto detection of languages
- Search results that compliment translated content
- Translation apps / Dictionaries that work in 'offline' mode.

	Pain Points	Opportunities
6.	<p>Translation through screen capture</p> <ul style="list-style-type: none">- Difficulty clicking on Google Lens- Hard to read translated text- Inaccurate / garbled translation- Discoverability of this translation method- Perception of method as 'technical'	
7.	<p>Speech-to-text translation</p> <ul style="list-style-type: none">- Translation quality- Word limits	

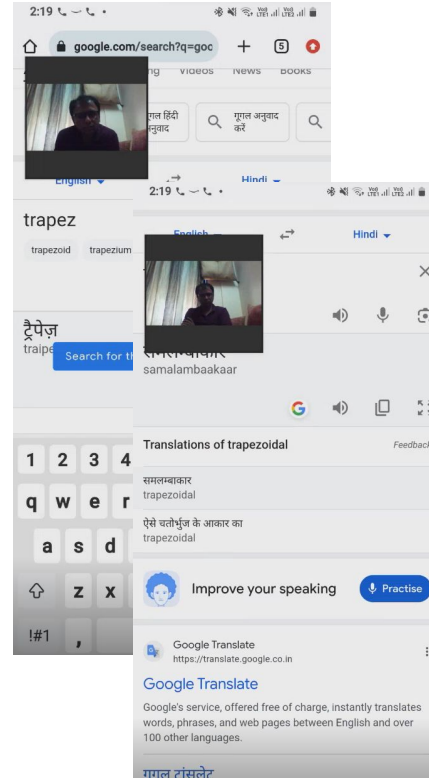
Value

Native Hindi speakers who are fluent in spoken Hindi, but not in reading or writing the Hindi script, appreciate:

- The pronunciation feature / audio option to 'hear' the translated text.
 - *The transliteration feature (available on Google Translate) helps some readers with this issue.
- Auto-complete word suggestions when typing out a Hindi word or sentence for translation.

इस कार्य का कोई भी भाग बिना अनुमति के पुनरुत्पादित नहीं किया जा सकता। हर रचनाकार का कॉपीराइट होता है। इस कानून को मत तोड़ो.

is kaary ka koe bhee bhaag bina anumati ke punarutpaadit nahin kiya ja sakata. har rachanaakaar ka kopeeraiit hota hai. is kaanoon ko mat todo.



While some appreciate transliterated text, for others transliterated Hindi text has a strong association with chat / informal texts, rather than reading online content. Some readers also note that transliterated text is hard to read quickly.

Gaps / Latent Needs

In addition to understanding pain points and what participants value in the translation solutions currently available to them, research also highlighted several gaps and latent needs.

Understanding and addressing gaps and latent needs can potentially empower MinT to innovate on translation solutions and more effectively address unmet user needs.

	Gaps / Latent Needs	Opportunities
1.	<p>When faced with formal / complicated Hindi content, readers who are comfortable reading in Hindi want to read the content in the source language itself, albeit in simpler Hindi.</p> <p>Currently, solutions only cater to translating content between different languages.</p>	<p>Same Language Translation <i>(Formal > Simple language)</i></p>

“I can read it on my own, but I might go to my dad to understand few words because this is like ‘theth’ (pure) Hindi.

The Hindi we use at home is a normal one, but when you write with essence of Hindi language then this is what it is, so this confuses me sometimes.

But I can go to my parents because they know Hindi very well so they can help me out with this.

For these things, I wouldn’t use a translator because that will be more cumbersome for me.

So I might go to my parents directly.”

(P35 - Monolingual Reader)



	Gaps / Latent Needs	Opportunities
2.	<p>Machine translation proficiently conveys *denotative meanings, facilitating easy and independent comprehension of content in unfamiliar languages.</p> <p>However, it falls short in capturing and evoking the cultural, and emotional nuances that extend beyond literal definitions. Consequently, translated content does not evoke the 'joy of reading' typically associated with original content.</p>	<p>Human-in-the-loop translation, has the potential to enhance translated content, and elevate it beyond mere understanding.</p> <p>Despite synonyms sharing dictionary definitions, their usage choices impact emotions and nuances differently.</p> <p>MT services can assist editors by highlighting words with multiple meanings and suggesting synonyms, enabling more effective translation of connotative meaning.</p>

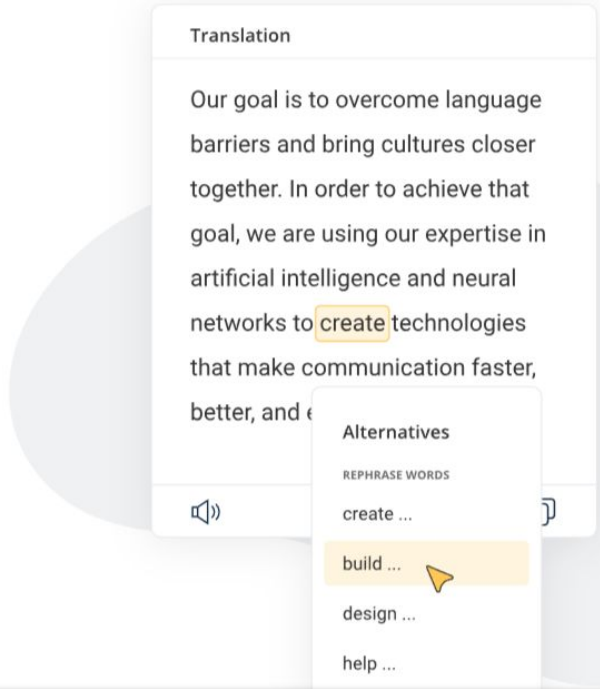
Select alternative words or phrases

Alternative translations save you the time of searching for a different word or phrase for your translation. Simply click on a word, choose between the alternative options, and the surrounding text will be automatically adjusted. It's that simple.

FEATURE INCLUDED IN

ALL PLANS

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Synonym suggestions to improve connotative meaning - The translation service DeepL has an 'alternate word / phrase' feature intended to allow editors to 'adjust' the translation to better suit the context.

While two words may share a similar or identical core meaning, they can have different connotations, tones, or subtle shades of emotion.

For example, while both the synonyms 'happy' and 'joyful' convey a positive and cheerful emotion, there are subtle differences in the intensity or quality of the happiness they express.

The choice between these synonyms can influence the emotional tone of a sentence.

Falling short of communicating emotions

“There could be some changes, because for example from where I come from, I know Hindi and then in Hindi, there would be four emotions for the word (Accha) good/right/okay. For example, if I say, Accha (by extending the last syllable), it is being said in a taunting way, it is like. And if I say, Oh Accha (in a light-mannered questioning way) there is little happiness, like there is a little curiosity in it.

Similarly, those who know Bengali, they know the meaning (of the blog), but I’m just reading it in English. So maybe I won’t be as emotionally connected as a Bangla person would be, after reading this blog.”

(P27 - Monolingual Reader)

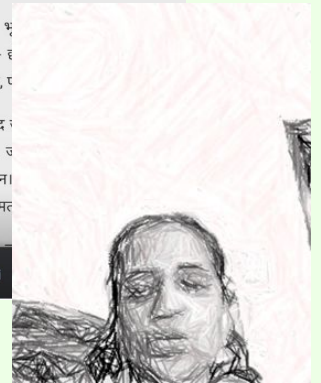


Falling short of communicating 'connotative meaning'

P36-Monolingual Reader articulates that in machine translation, the language is translated, but not the meaning.

Although the words have been translated, it falls short because it needs the human mind and time to translate meaning.

Outside study conditions, she would abandon the translation, and search on Google to find human written content.



Synonyms can convey different emotions

“So it's better that the translation should be on the site itself.

*Like it is written plan your ‘journey.’ (On the Delhi Metro site)
So it is not necessary that it will take the exact word, it is possible that it will take another synonym of that.*

*Google Translate made it plan your ‘trip’.
So it will take the meaning but not the exact word.”*

(P30 - Monolingual Reader)



	Gaps / Latent Needs	Opportunities
3.	<p>Current machine translation solutions sometimes fall short when it comes to:</p> <ul style="list-style-type: none">● Differentiating between literal / metaphorical translation appropriateness● Translating language style and syntax● Translating vocabulary that lacks a direct corresponding meaning in another language	<p>Translated content must balance between staying true to the original meaning and making content in the target language accessible and meaningful.</p> <p>This can be accomplished by:</p> <ul style="list-style-type: none">● Advanced MT capability that is more versatile and proficient in handling the intricacies of language● Enabling human editors to easily cross reference between the original and machine translated content

“Sometimes, especially in German language when I translate something to Hindi or English, then they cannot translate a particular word.

*They put rectangular boxes for that word.
It cannot be translated or they don't have words for it in English... I don't know why.*

It became difficult to understand what it is, because I cannot understand the word from the box that has been put over there. Sometimes they put dots for that word.”

(P35 - Monolingual Reader)



*“I don’t think I got the complete translation from the one, that I was using. (Google Translate)
They just translate it for reading purpose only.*

Like you can get the meaning out of the content but that continuity is sometimes missing and it is less accurate.”

(P35 - Monolingual Reader)



	Gaps / Latent Needs	Opportunities
4.	<p>The quality of machine translation can vary depending on the specific language pair selected, based on linguistic or cultural similarity.</p> <div data-bbox="278 437 1022 767" style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <p><u>Workflow 10</u> <i>Translate (to English) > Translate > More Languages (to Hindi)</i></p> <p>A reader opted to translate the web page in an unfamiliar language into both Hindi and English, in order to compare translation quality.</p> </div>	<p>Where user selected language pairs are very diverse, the translation output may not be accurate.</p> <p>In such cases, consider recommending alternate translation pairs that are likely to be more accurate.</p>

Content contribution through manual translation

Manual Translation

Readers currently use automatic translation for personal benefit.

*Dedicating time to *manually translate online content for the benefit of others is an entirely alien concept to study participants.*

Participants shared demotivators and concerns related to this new conceptual model.

Additionally, participants shared potential motivators and the support they might require for a possible transition towards contributing online content through manual translation.

Demotivators

Key demotivators include:

Typing in the Devanagiri script

- Need for a Hindi keyboard or software
- Typing in Hindi is considered to be more 'time consuming' as compared to English typing

The perception that manual translation is redundant

- Easy availability of online machine translation services make the effort required for manual translation feel unnecessary

“Sir, it is hard to use the Hindi keyboard. So, there is a problem in typing these letters. The half words. (Like ‘Ang’)

I use the language used in social media chats like WhatsApp, ‘kahaan jaa rahe hain’. That language is used by everyone. I am not that weak in English that a, b, c, and d also I don’t know. So, ‘kahaan jaa rahe ho’ - these small words, I write. If one or two words are misspelled, then there is no problem with it. It is manageable.

Sir, Hindi is easy to speak. But it is a very difficult language. It’s words and many other things are very difficult to write. If we are writing in a notebook, then it is easy to write. But on mobile or laptop, I think Hindi is very difficult to write. It is easy on WhatsApp. There is one option like a speaker. If I press it and speak, then it will come in written format.”

(P33 - Monolingual Reader)



Demotivators

2 out of the 4 Chhattisgarhi participants questioned the relevance of using translation to create written Chhattisgarhi content, since Chhattisgarhi is primarily a 'spoken language' or a 'tone'.

However, P-34 Monolingual Reader speculated that written Chhattisgarhi content may become relevant in the future - With a new Chhattisgarhi script under development, and Chhattisgarhi language learning recently made mandatory in local schools.

"If I tell him that I am translating it in Chhattisgarhi language and you have to read it, then it will take more effort for him to read Chhattisgarhi than reading Hindi.

It's easy to speak Chhattisgarhi than reading it.

You can speak Chhattisgarhi, but it's more difficult to read Chhattisgarhi than Hindi.

If you talk about me, then I won't do it.

But in the coming years this thing is good. Because the children will have it in their syllabus.

In school it wasn't mandatory to include it in the syllabus but now it has become mandatory.

So they will get an option because it's their mother tongue and it's easy so it will click instantly in their mind."

(P34 - Monolingual Reader)



P36-Monolingual Reader feels that Chhattisgarhi is not so much a different language as a ‘tone’.

(To create Chhattisgarhi content) -

“First, I will have to translate it from English to Hindi, and then I will have to translate it from Hindi to Chhattisgarhi tone.”



Concerns

Participants shared concerns about the impact of poor quality translations and unverified contributors on online/Wikipedia content quality and integrity.

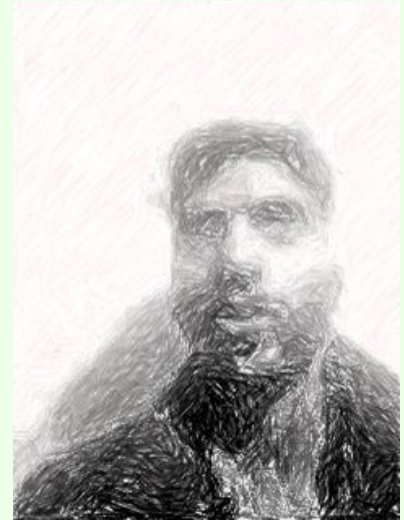
- Readers anticipate that translation quality and accuracy may drop with unverified contributors, or with contributors who are readers rather than 'regular content creators'.

“Wikipedia works like open-source and it can be updated everyday.

So what I wish is that whoever modifies the data, they should have a verified account so that nobody gets to create any fake data that may create confusion or may be irrelevant.

A verified person only should be able to modify it. Wikipedia must create such criteria that only a person who fulfills them can modify content.”

(P26 - Monolingual Reader)



Motivators

Readers' contemplation of content contribution through manual translation is influenced by intrinsic, altruistic or extrinsic motivators:

- **Intrinsic** - Personal fulfillment
'Passion for the topic', 'Passion for writing'
- **Altruistic** - Contribution to others, Sense of purpose
*'Using one's knowledge to help others',
'Help Awadhi/Chhattisgarhi people in interiors, rural India or migrants in urban India who don't speak Hindi or English'*
- **Extrinsic** - Expectation of some kind of credit (incentives/recognition) or scale of reach in return for the effort put in

Support

Readers shared the different types of support they may require to transition towards online content contribution through manual translation:

- Feedback and support on doubts or questions - Prior to, during or post contribution
- Easier ways to type in Hindi
(*e.g. Speech to text / auto-complete*)
- Publishing support

“My name written over there, like ‘edited by S-----’ or something like that.

Kind of a credit that Wikipedia will give to me.

If I’m getting some credit, if I’m getting some appreciation through Wikipedia, then I’ll be more grateful.

I’ll be willing to do it.”

(P27 - Monolingual Reader)



“If I am editing anything, then there should be any person who can review that and tell me that ‘see this - you are doing wrong’. Or he may brief me that this is how you should do it. The person can verify whether it is translated in a correct manner or not.

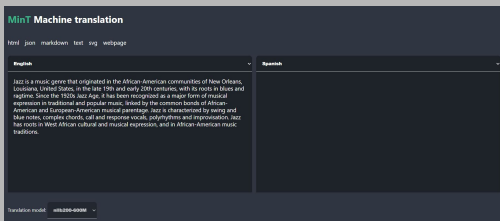
Maybe there should be some community on Telegram. In which if I am having some problem, then I can talk to. People who are like minded. They are also doing the same thing. And I can put a question there. Then they can help with that. There can be a community of the support group.”

(P30 - Monolingual Reader)



MinT Translation Service

MinT Translation Service



Participants were briefed about the MinT translation service, and given access to a [Mint prototype](#) that they could try out.

The prototype allowed translation of English content into Hindi/Awadhi/Chhattisgarhi. Participants were instructed to envision an additional feature that would enable them to improve quality by reviewing and correcting the translation.

During this final part of the discussion, an effort was made to understand the factors that would motivate or discourage readers in using this service to contribute content.

Motivators

Participants were driven by altruistic and extrinsic motivators to utilize machine translation for content contribution.

- *'Expand own experience to help others'*
- *'Make content in mother tongue available to more people'*
- *'*Public visibility or acknowledgement' (vs. 'invisible input' to improve translation quality.)*

Motivators

The differences in intrinsic motivations for contributing content via automatic translation vs. manual translation are noteworthy.

Automatic Translation (MinT)

- *'To add the 'emotional connect' that machine translation misses'*
(Potential to improve machine translation quality)

Manual Translation

- *'Passion for the topic', 'Passion for writing'*

Motivators

Additionally, participants were motivated by:

- The good translation quality of MinT
'Confident that originality is intact in translation.'
- Low time investment
'Time saving - Auto translated text as a framework'
'Easier than manually translating'

“I can spend less time and I can help others who may be having the problems that I might have experienced. And I'll also get to give my opinion.

That is just my knowledge. But when I read something, I'll know the issues that I experienced. So I'll have a point of view about the issues.”

(P26 - Monolingual Reader)



Demotivators

Lacking confidence in their own ability to improve translation quality, some readers prefer to contribute minimally or to just share feedback:

- Small corrections
- Word substitutions
- E-mail feedback
- Thumbs up/down along with a brief description of the issue

Recommendation - Offer a range of contribution options. Encourage and support hesitant / unconfident readers to gradually progress toward more significant contributions.

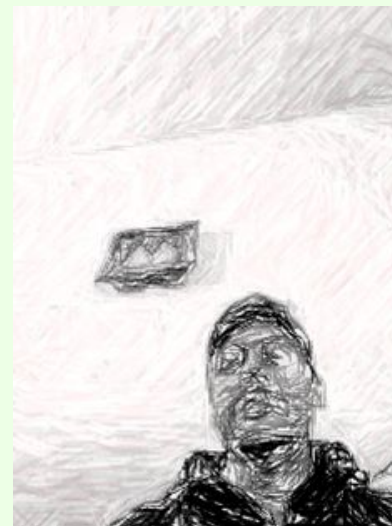
“I will send an email. I will not prefer to change it. If there is an option that says ‘if you have a problem with quality of translation then email your concerns’, then I will do it.

Let's say somebody edits wrongly, the work of the people maintaining the site will increase.

If you are giving the public the edit rights, and I write something wrong, how many people will see it world-wide?

No. I won't use the edit option. But if there is email options, I'll send that. I'll write the description of what the mistake is.”

(P25 - Monolingual Reader)



"I won't do it, but people who are content creators, they should do it.

Because we can speak the language, but when it comes to writing then we need a deep knowledge of the language.

A lot of words have different meanings.

In Hindi there are many words which have different meanings, that's why we say poetry. So the people who have knowledge of the language will be able to write the content better than me. So I would say it will be better if they will only write it."

(P34 - Monolingual Reader)



Demotivators

While participants appreciate the English-Hindi translation quality on MinT, P-34 Monolingual reader highlighted issues with the English-Chhattisgarhi translation quality.

Use of Hindi words

“There is a difference in the local language and Hindi.

The words should be in Chhattisgarhi.

A lot of words are similar to Hindi... A lot of Hindi words are also in it. (translation)

People who have knowledge of Chhattisgarhi dictionary, they will be able to tell you this. Like it's written here, ‘utpatti ke saath hai’, so this is a Hindi word.”

Redundant words

“The words have not been written properly.

For example ‘vyakti ke pramukh roop me maanyata di gai hai.’

So these are few extra words, it's not necessary. ‘Manyata di hai’ would be correct, ‘gai hai’ is extra.

We don't have fun reading it. I mean it's getting complex.”

(P34 - Monolingual Reader)



Conclusion

Evolve beyond a 'practical' solution to enhance applicability

1

There is an opportunity for MT to evolve beyond its current practical function, and potentially support the cultural and emotional needs of readers.

2

Advanced MT features geared towards handling the intricacies of language and culture, are needed, to overcome the existing limitations of MT in balancing between source and output.

3

Inspiration for functions that a culture sensitive translation solution could take into account are highlighted through the research.

Develop features and solutions to provide added value

4

Translation solutions could potentially extend to include language learning features or additional resources for more comprehensive understanding, clarification and verification of translated material.

5

The 'Review and Correct' function of MinT can be further enhanced through relevant features for faster typing, incorporating connotative meaning or mitigating language and cultural context linked limitations.

6

Research highlights the relevance of simplified and offline-accessible features or solutions for 'low exposure users' and users with limited data plans.

Inspire and support readers to utilize MinT

7

Explicitly communicating that readers can play a significant role in advancing the quality and applicability of machine translated content could inspire more readers to use MinT.

8

Offering a range of contribution options, and including quality check and feedback into the 'Review and Correct' process could also encourage and support more readers towards using MinT.

Draw inspiration from current solutions to inform further development of MinT

9

Pain Points, Gaps and Latent Needs identified through observation of reader workflows on current translation solutions suggest that there is an opportunity for MinT to have broader applicability outside Wikipedia.

10

Features and aspects of current translation solutions that readers highlight as valuable, offer inspiration for future iterations of MinT.