

LANGUAGE BARRIER REDUCTION AND TECHNOLOGY UPSCALING

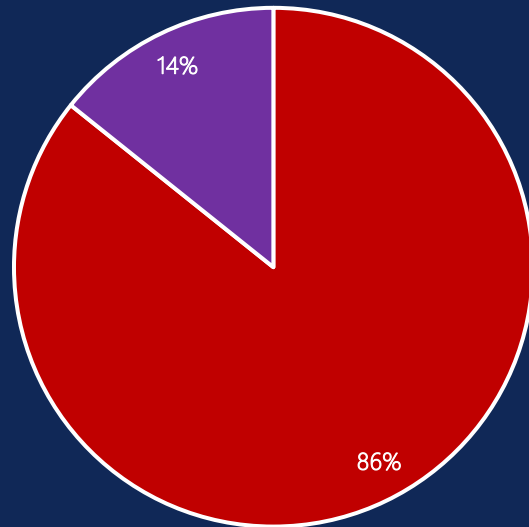
CONTENTS

- Introduction
- Problems
- Solutions
- Costs and Benefits

QUESTION

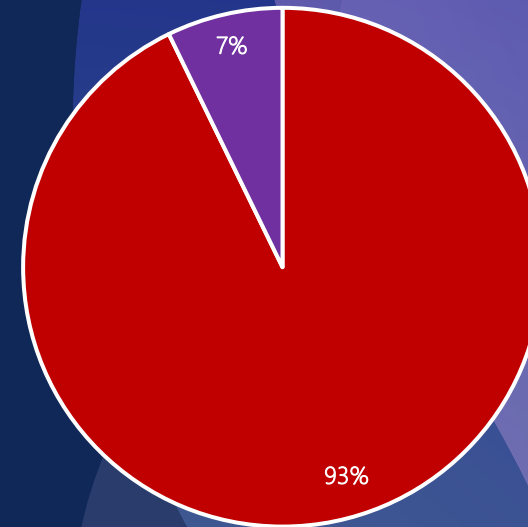
How can Microsoft and The Canadian Government use technology to upscale workers?

Native English and French Speakers vs Non-Native English and French Speakers Before 1980

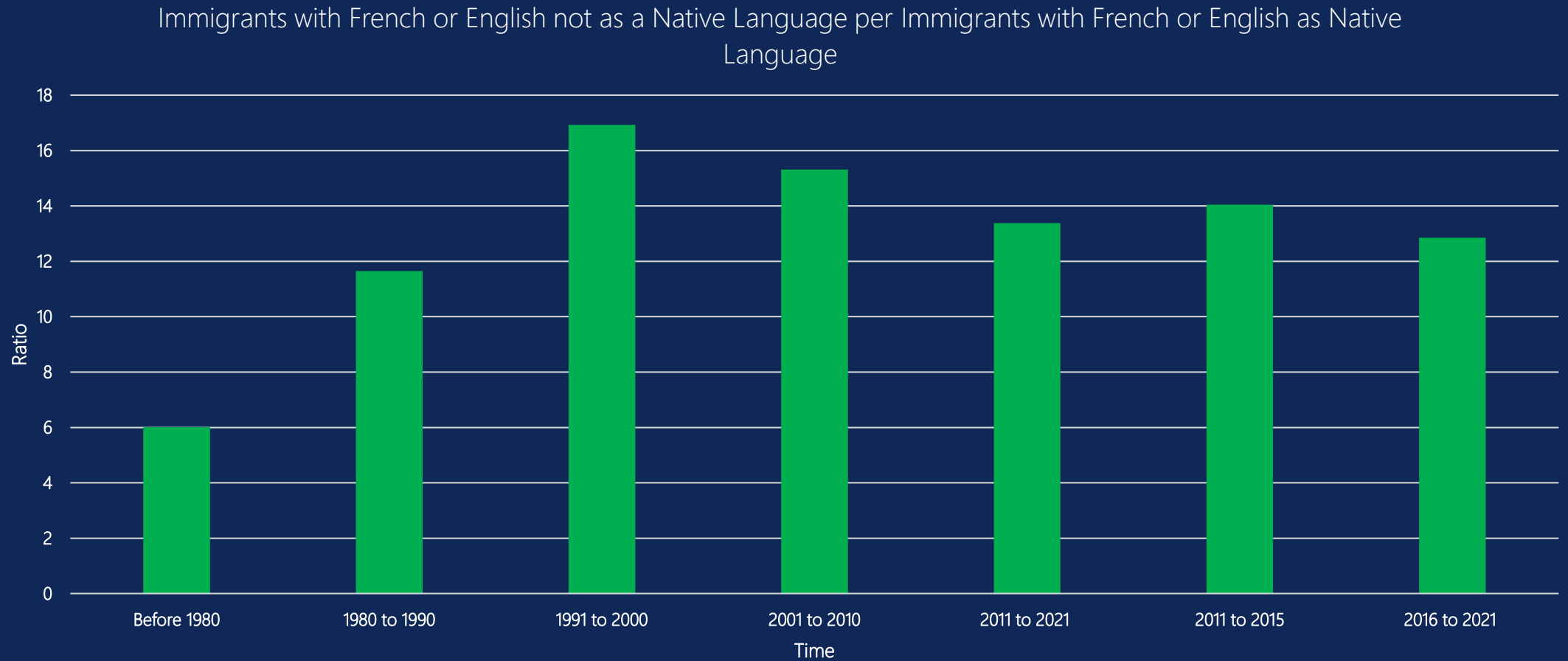


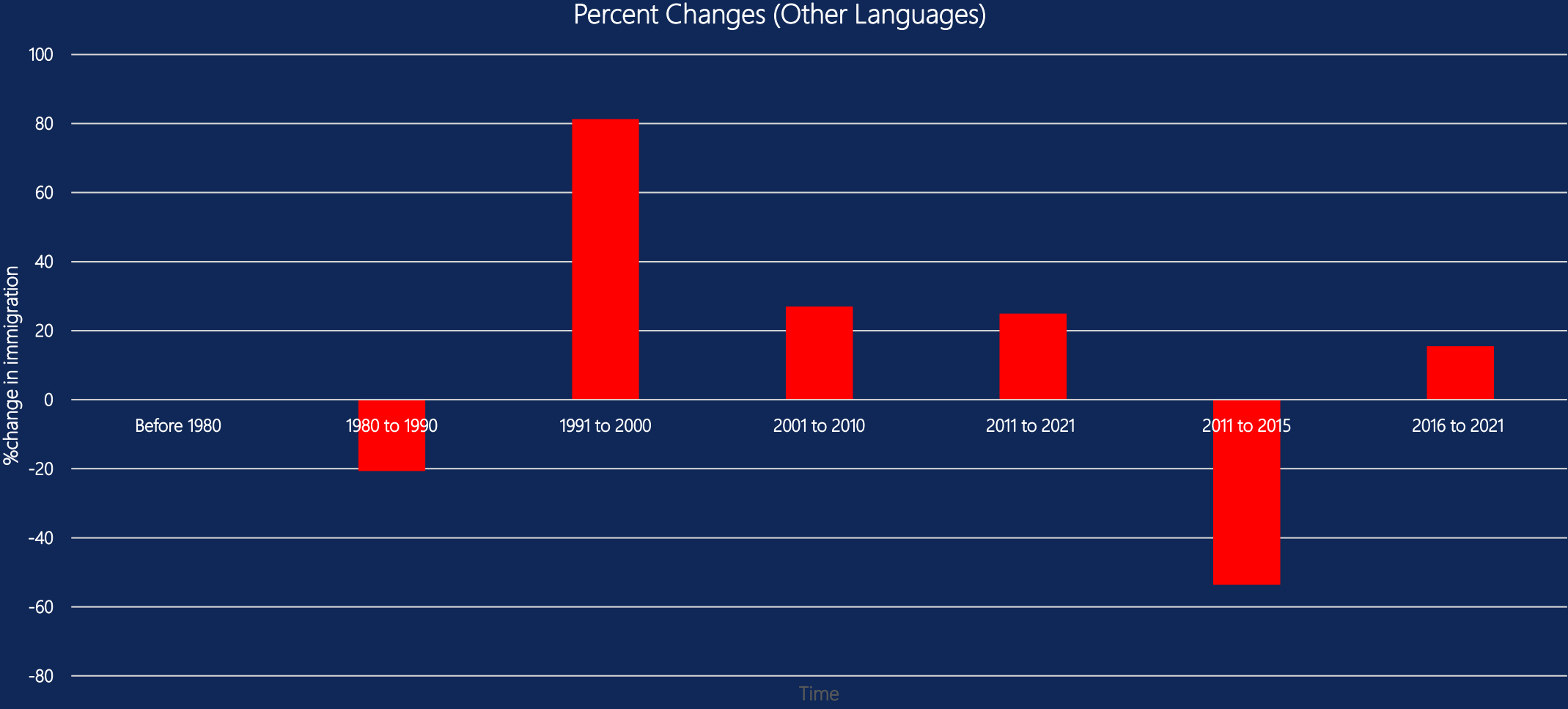
■ Every Other Language in this list
■ Microsoft Learn Supported Languages(English and French)

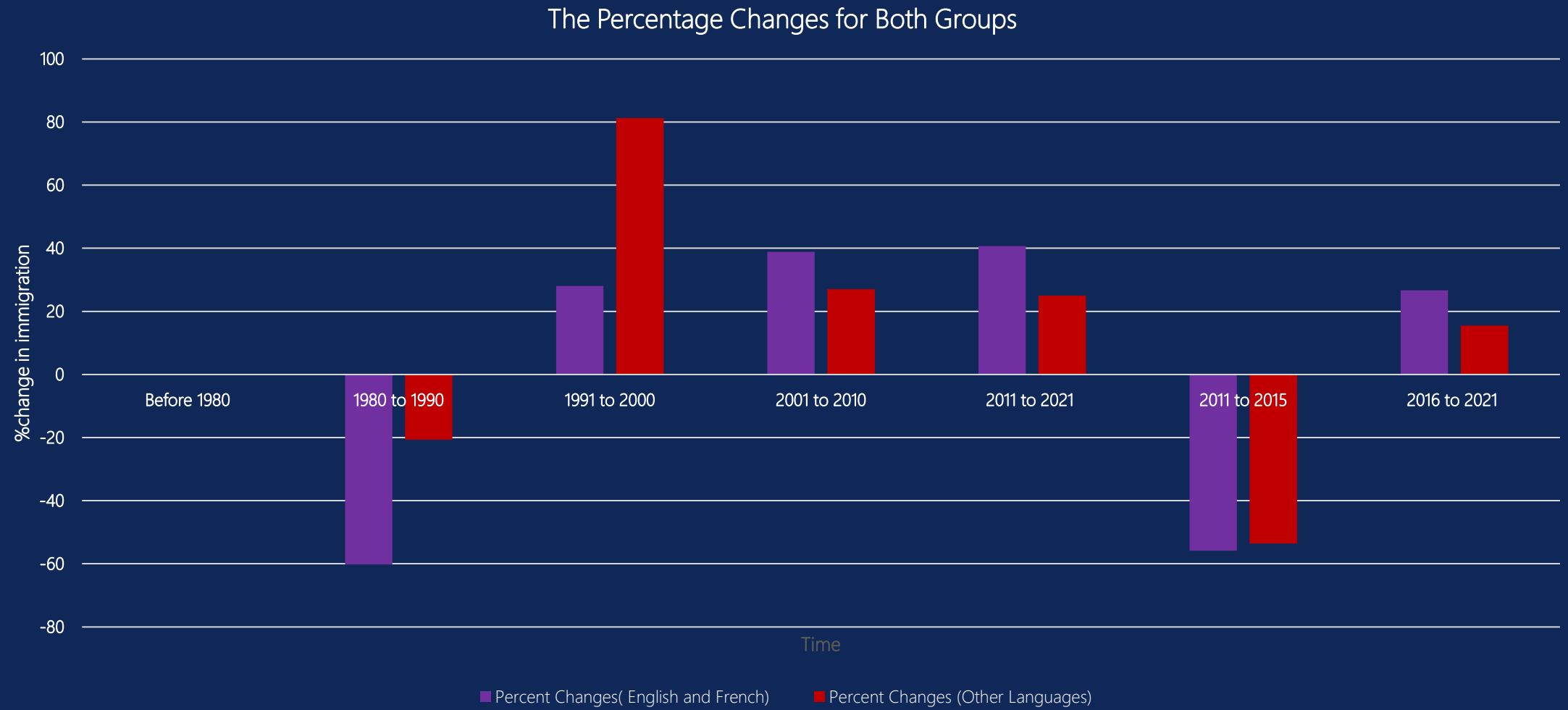
Native English and French Speakers vs Non-Native English and French Speakers 2016-2021



■ Every Other Language in this list
■ Microsoft Learn Supported Languages(English and French)





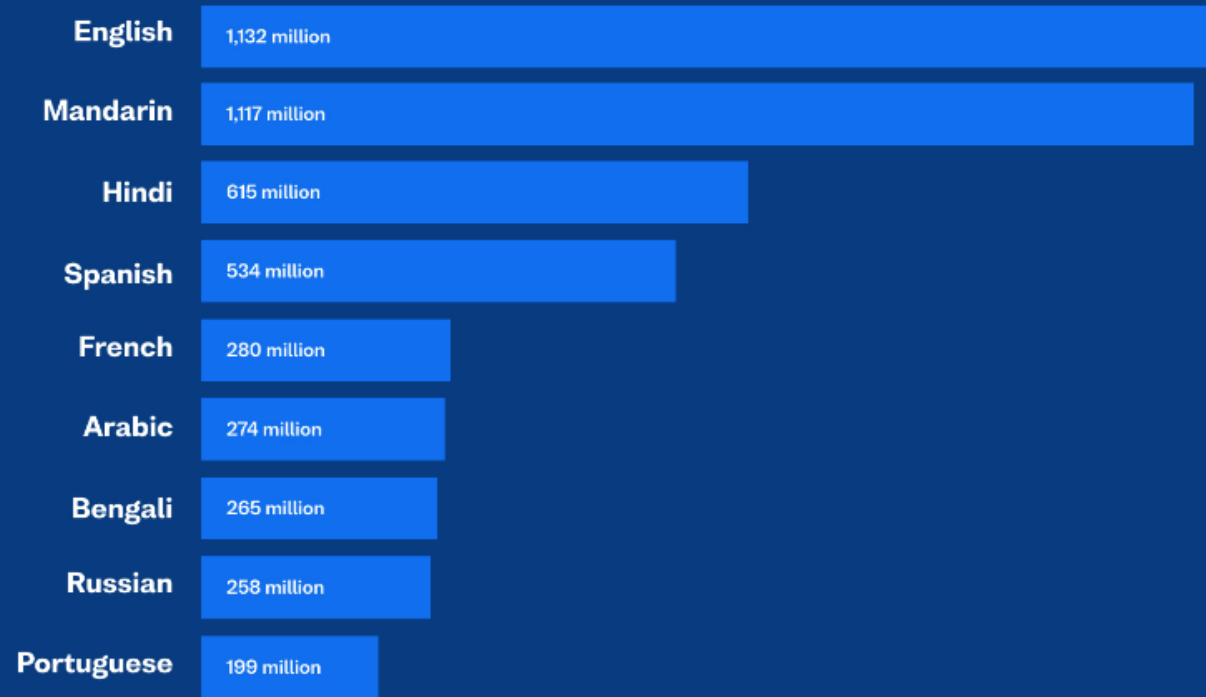


BILANG BUILT-IN INTEROPERABLE LANGUAGE-AGNOSTIC NAME GENERATOR

STEP 1

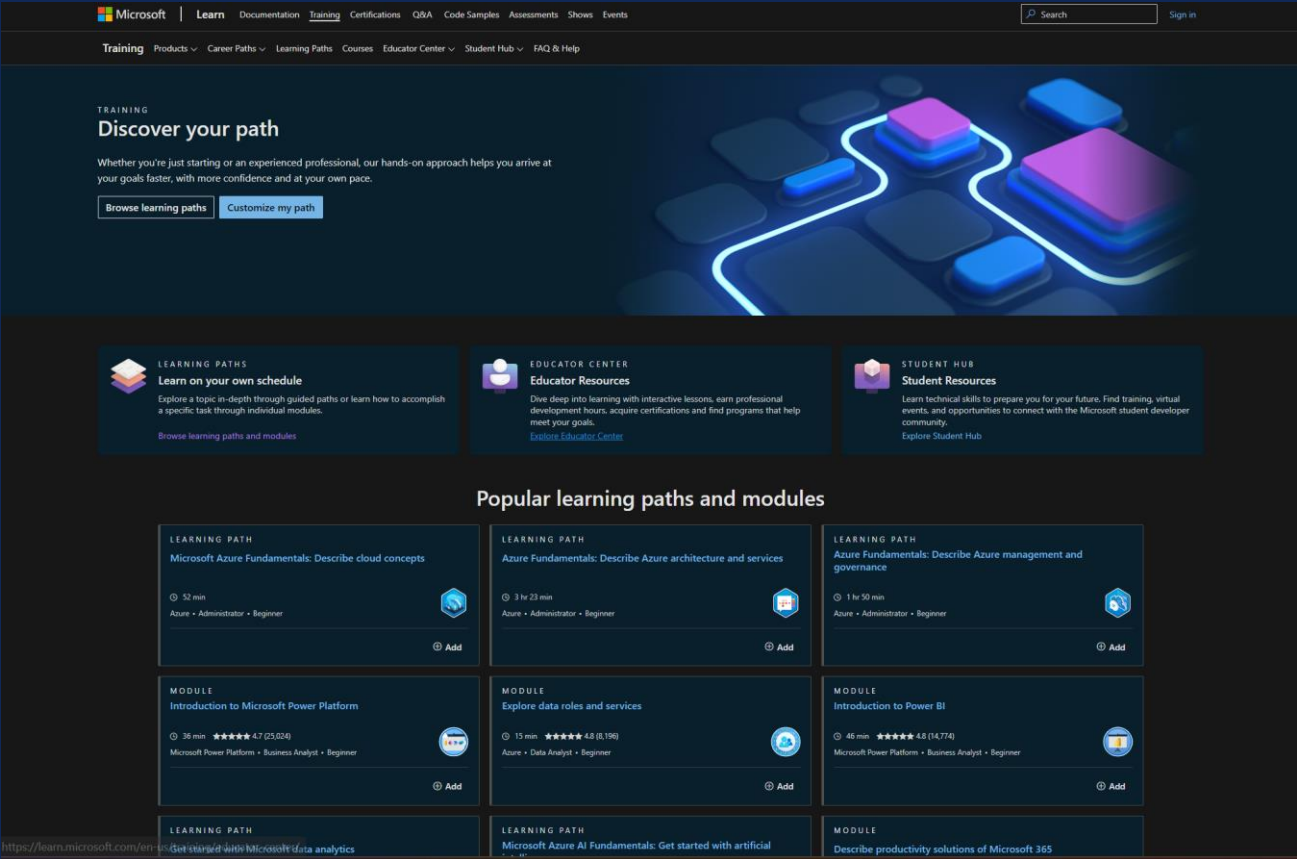
Gather Data on Different Languages (words in English with it's equivalent in a foreign language)

Most spoken languages



STEP 2

Allow for Microsoft Learn to have versions in Different Languages (including code)



STEP 3

Fine-tune a generative AI model on translations between non-English written languages and code

Model	Training	Usage
Ada	\$0.0004 / 1K tokens	\$0.0016 / 1K tokens
Babbage	\$0.0006 / 1K tokens	\$0.0024 / 1K tokens
Curie	\$0.0030 / 1K tokens	\$0.0120 / 1K tokens
Davinci	\$0.0300 / 1K tokens	\$0.1200 / 1K tokens

STEP 4

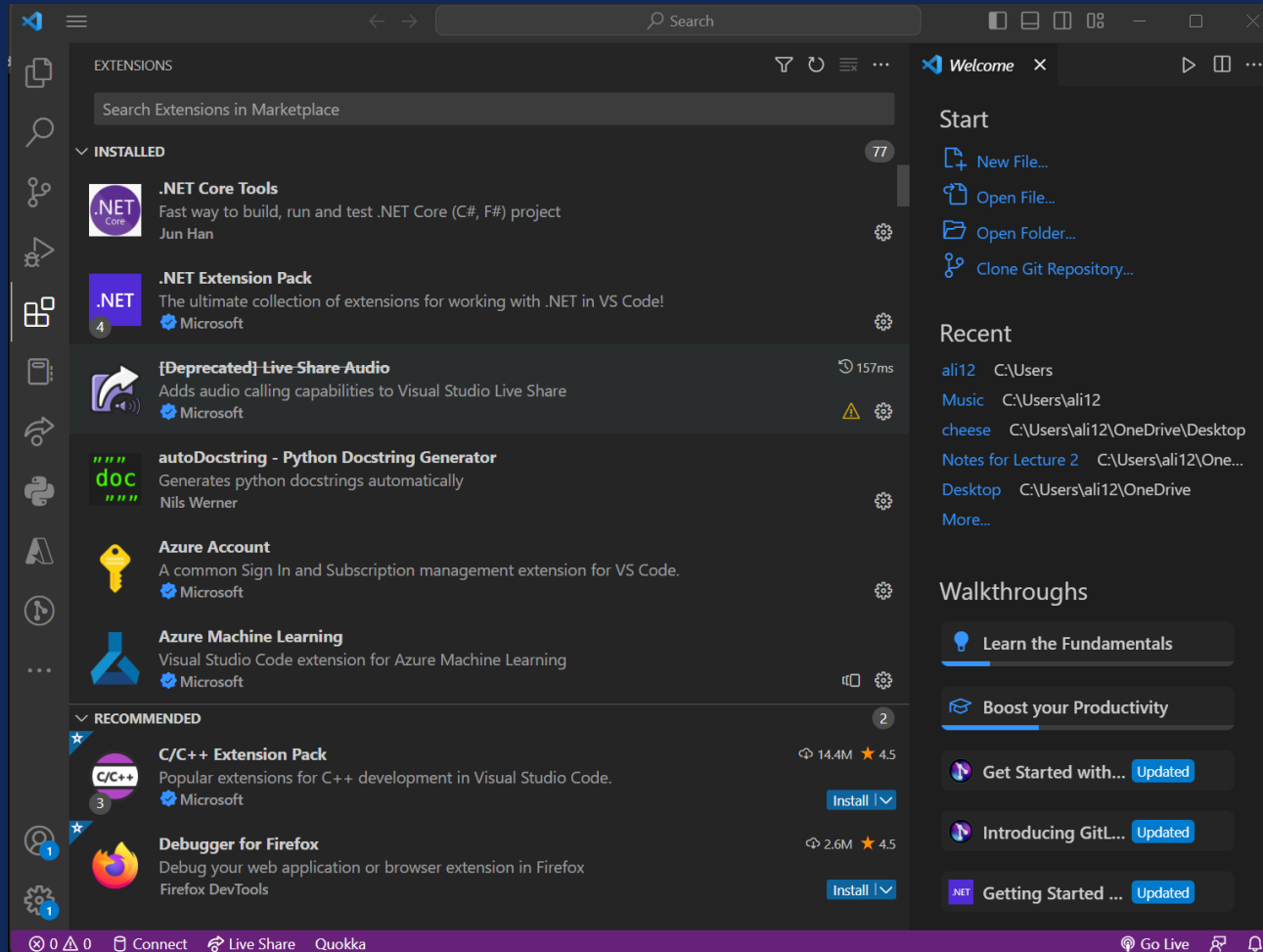
- Use the translation AI to create natural IntelliSense suggestions and translate the code into English at compile time.
- Free extension to provide functionality of translating the code into another language for editing, and then translation back into the original file language.

A DEMONSTRATION OF PRE-EXISTING INTELLISENSE:

```
1  #include<stdio.h>
2  #include<stdlib.h>
3
4  int main(){
5      |
6      return 0;
7
8
9  }
```


STEP 5

Publish the translator on the VS Code Marketplace
as an extension for free use by the public



STEP 6

Market the extension on Microsoft Learn and Canadian Government Websites, to promote inclusive learning in Computer Science

**Government of Canada**
Gouvernement du Canada

Français


Search IRCC

MENU

[Canada.ca](#)





Immigration and citizenship


Apply to travel, study, work or immigrate to Canada, apply for citizenship, a permanent resident card or refugee protection, check the status of your application or find a form.



ATLANTIC IMMIGRATION PROGRAM


[Hire through the Atlantic Immigration Program](#)

Follow:    



For people affected by the Russian invasion of Ukraine

[Learn about new measures in place to help people affected by the Russian invasion of Ukraine.](#)



Canada's response to the situation in Afghanistan

[Learn about Canada's response and the supports that are available.](#)

Microsoft | Learn | Documentation | Training | Certifications | Q&A | Code Samples | Assessments | Shows | Events

Search Sign in


Training | Products | Career Paths | Learning Paths | Courses | Educator Center | Student Hub | FAQ & Help


TRAINING


Discover your path

Whether you're just starting or an experienced professional, our hands-on approach helps you arrive at your goals faster, with more confidence and at your own pace.










[Browse learning paths](#) [Customize my path](#)

**LEARNING PATHS**
Learn on your own schedule
Explore a topic in-depth through guided paths or learn how to accomplish a specific task through individual modules.
[Browse learning paths and modules](#)

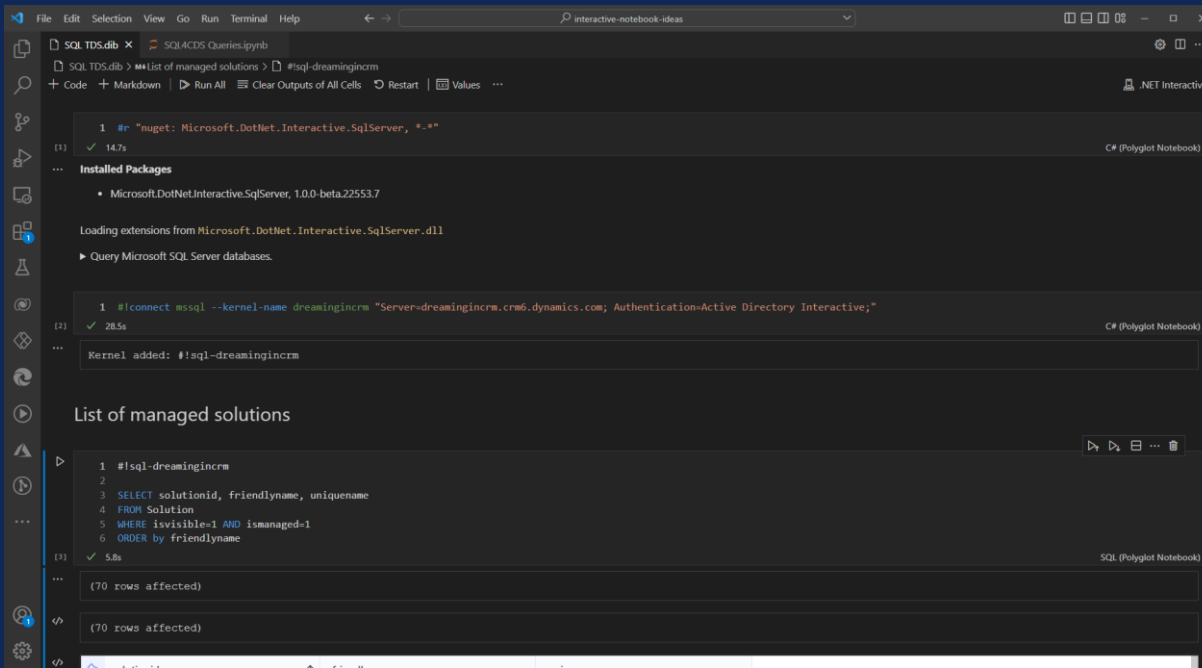
**EDUCATOR CENTER**
Educator Resources
Dive deep into learning with interactive lessons, earn professional development hours, acquire certifications and find programs that help meet your goals.
[Explore Educator Center](#)

**STUDENT HUB**
Student Resources
Learn technical skills to prepare you for your future. Find training, virtual events, and opportunities to connect with the Microsoft student developer community.
[Explore Student Hub](#)

Popular learning paths and modules

LEARNING PATH Microsoft Azure Fundamentals: Describe cloud concepts ⌚ 52 min Azure • Administrator • Beginner 	LEARNING PATH Azure Fundamentals: Describe Azure architecture and services ⌚ 3 hr 23 min Azure • Administrator • Beginner 	LEARNING PATH Azure Fundamentals: Describe Azure management and governance ⌚ 1 hr 30 min Azure • Administrator • Beginner 
MODULE Introduction to Microsoft Power Platform ⌚ 36 min ★★★★★ 4.7 (2,024) Microsoft Power Platform • Business Analyst • Beginner 	MODULE Explore data roles and services ⌚ 15 min ★★★★★ 4.8 (5,196) Azure • Data Analyst • Beginner 	MODULE Introduction to Power BI ⌚ 48 min ★★★★★ 4.8 (14,774) Microsoft Power Platform • Business Analyst • Beginner 
LEARNING PATH Microsoft Azure AI Fundamentals: Get started with artificial intelligence ⌚ 1 hr 15 min Azure • Data Analyst • Beginner 	LEARNING PATH Microsoft Azure AI Fundamentals: Get started with artificial intelligence ⌚ 1 hr 15 min Azure • Data Analyst • Beginner 	MODULE Describe productivity solutions of Microsoft 365 ⌚ 1 hr 15 min Microsoft 365 • Administrator • Beginner 

STEP 7



- Grant businesses and consumers a premium version for added features.
- Premium extension would generate hard-coded translation maps for entire libraries
- Increases reliability and speed up both IntelliSense suggestions and compilation
- Provide a Polyglot Notebooks driver for supporting multiple written languages in the same file.

PROPOSED VERSIONS OF C# IN DIFFERENT LANGUAGES

```
System.Console.WriteLine("Hello World");
```

```
Sistema.Consolle.ScriviRiga("Ciao Mondo")
```

```
Sistema.Consola.EscribirLínea("Hola Mundo")
```

```
प्रणाली।सांत्वना देना।लाइन लिखें ("हैलो वर्ल्ड")
```

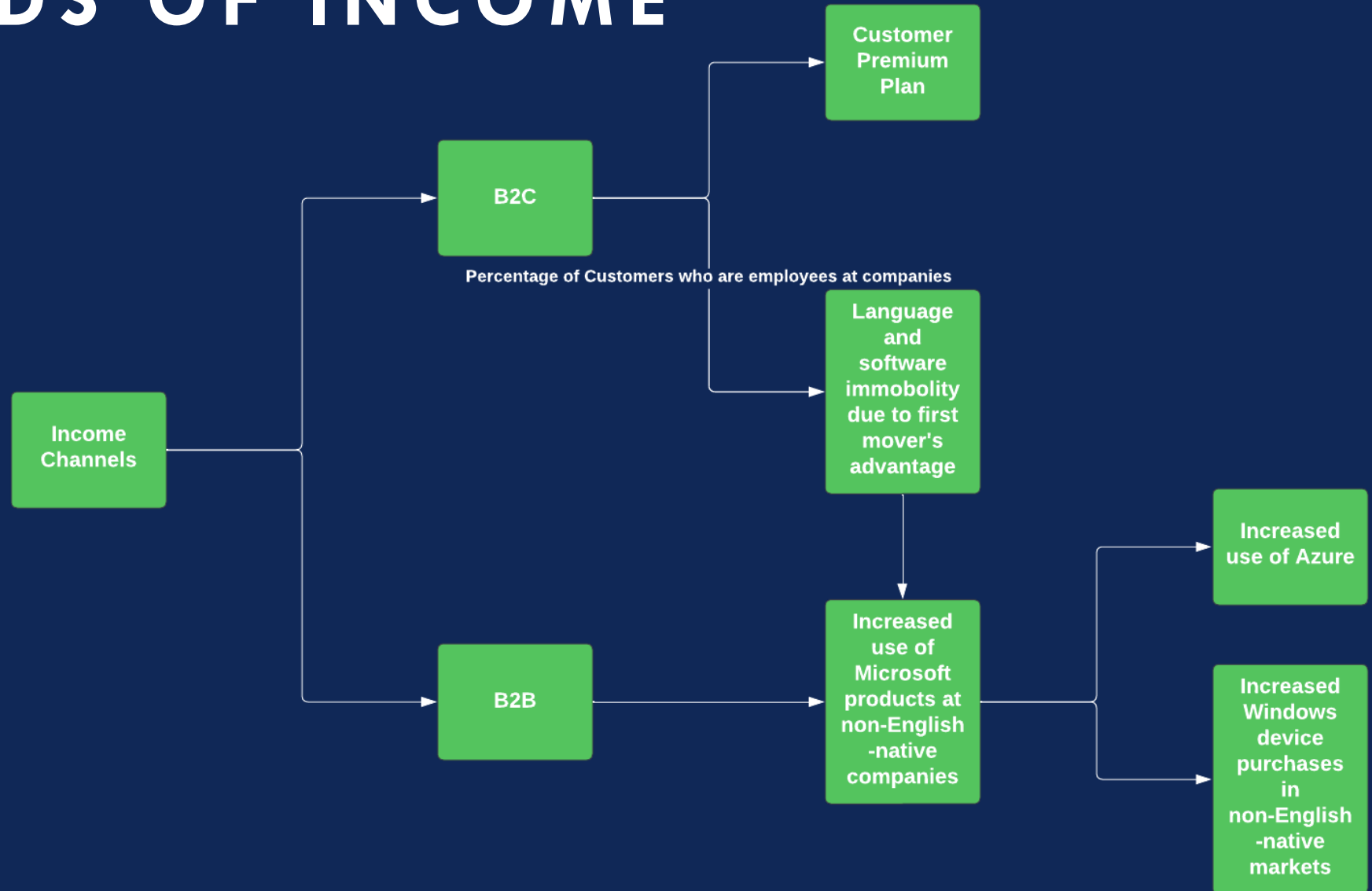
```
نظام . وحدة التحكم. اكتب الخط ("مرحبا بالعالم") ؛
```

```
系统 .安慰 .写线("你好世界")
```

PREMIUM EXTENSION

- Available even when demand is high
- Faster response times
- Priority access with new features
- Funds free edition

METHODS OF INCOME



OTHER BENEFITS:

- Older people may be allowed to code, forgoing the barrier of learning a new language, resulting in an increase in market share, as well as, number of demographics targeted.
- This extension may make Microsoft's products more favourable to non-English-native regions if their native languages can be used in code.
- Microsoft and foreign companies it's chooses to partner with may experience less language barriers for projects that require horizontal integration.

POTENTIAL COSTS

- Data acquisition, preprocessing, and quality assurance may be expensive and volatile due to syntactical and semantic differences between languages, and inconsistencies between dialects.
- The high cost of computation resources required to train a custom model, if needed, including but not limited to specialised hardware (i.e. GPUs and NPUs) and powerful processors.
- Difficulty in developing efficient optimisation models and model architecture, if a custom model is needed.
- Potential need for linguists to rectify incorrect use of languages.
- Complex and time-consuming testing story.
- Marketing costs associated with informing consumers of the new extension.

BREAK-EVEN POINT

According to calculations done, even if Microsoft would have 50 percent of their active current coders install this extension and manage to have 11.5 million new users-created by the new features of the extension (which is a gross underestimate).

Breaking even would require said users to subscribe to the premium service for only 5 dollars a month for 8 months to absolutely break even.

PROFIT CONDITION

The competitive advantage of BILANG is guaranteed; in the case where fine-tuning a GPT model, such as Instruct DaVinci, is impractical for this use case, the training of a new model is still relatively cheaper for Microsoft as a first-mover in this sector due to its significantly discounted costs versus what the competition would have to pay to achieve the same functionality, whether or not they use Microsoft services; therefore, if the userbase of BILANG has even a $x\%$ chance of becoming a paying user of a Microsoft product, they will make a profit

EXCLUDED FACTORS IN THE BREAK-EVEN

The breakeven point excluded some potential profit channels.

- all potential B2B prospects which are likely to increase due to a potential increase in Azure users as mentioned in the Methods of Income slide.
- all users (Non-native-English) who may purchase Windows devices to enjoy the features.
- Decreased cost occurred due to lower training time needed to teach code.
- All individuals who feel like learning new languages may be difficult who will begin to code

**“EVOLVING A CULTURE OF INCLUSION CAN BE
PARTICULARLY URGENT—AND NECESSARY—WHEN
AN ORGANIZATION EXPERIENCES DRAMATIC
GROWTH”**

(Microsoft Diversity and Inclusion Report 2022)



THANK YOU
