

Internet Access Among Low-income Households in Seattle

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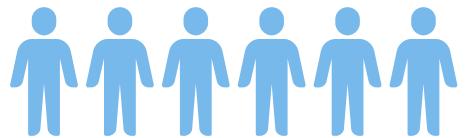
Seattle, WA

This project aims to address the digital divide in Seattle by providing internet access to low-income communities who lack it in their households, with Congress being one of the stakeholders involved in the effort to promote digital equity.

Population estimate: 733,919

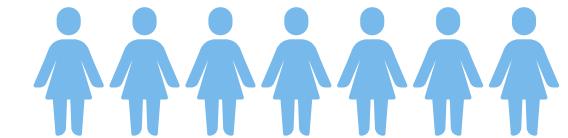
July 1, 2022

MALE



48.3%

FEMALE



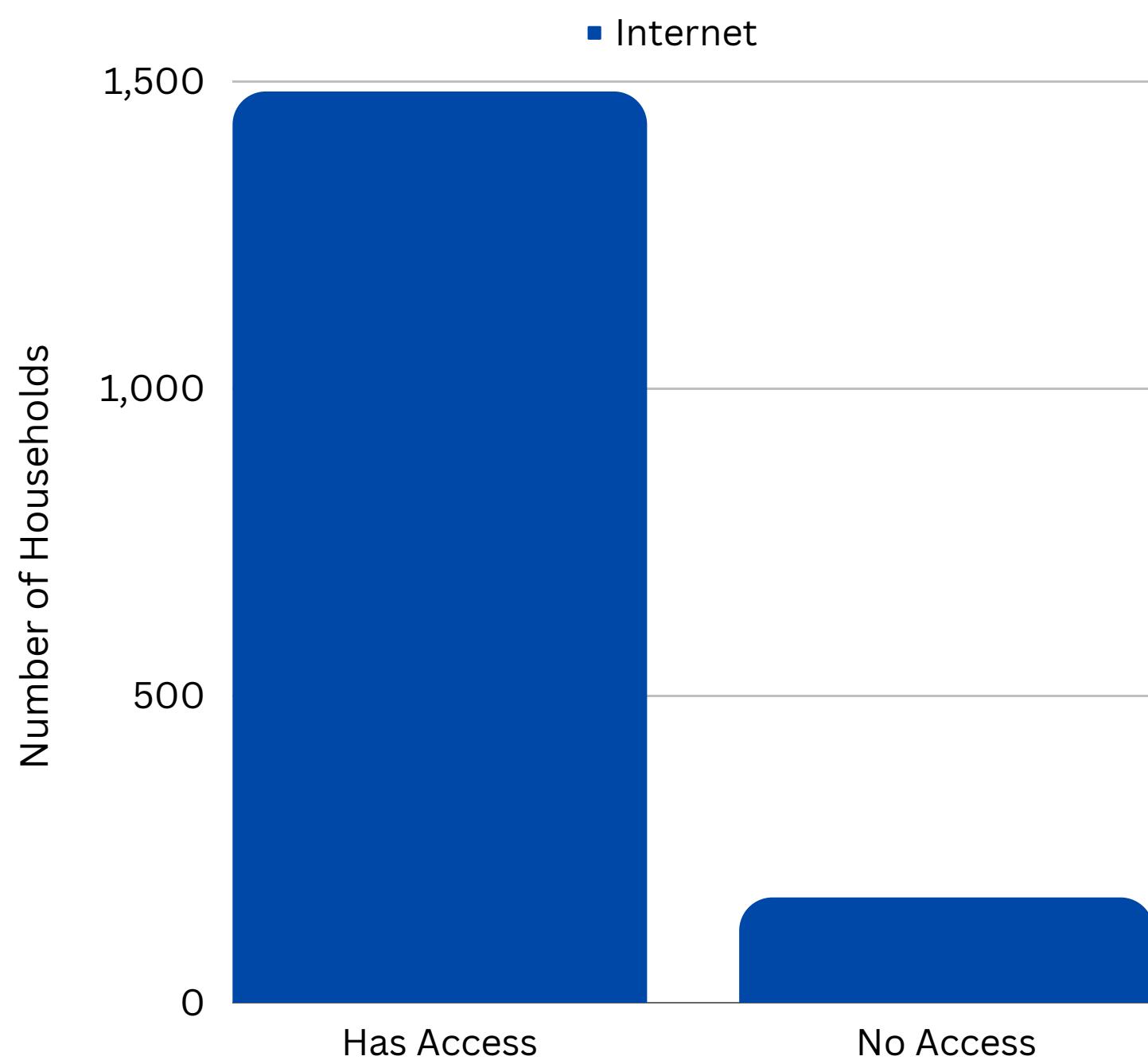
49.3%

Computer and Internet Use

Households with a computer, 2017 – 2021: 96.8%

Households with a broadband Internet subscription: 92.9%

City of Seattle Data Portal

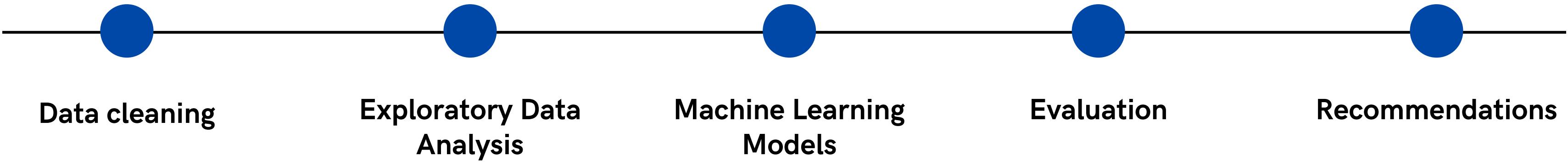
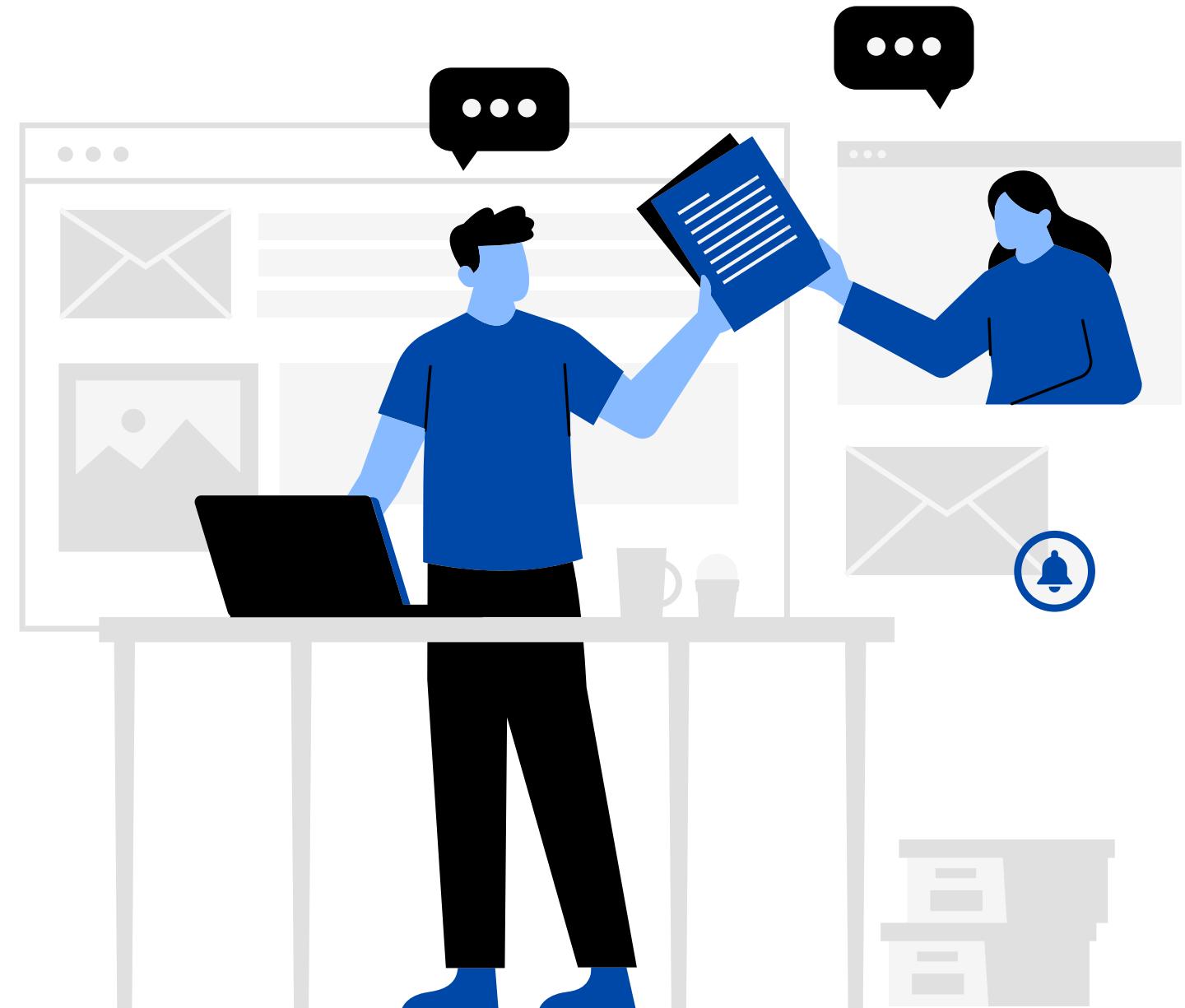


- 2018 Technology Access and Adoption Survey** ✓
- 4,315 Survey Respondents** ✓
- 38 Survey Questions** ✓
- Dataset includes 4,315 rows and 479 columns** ✓

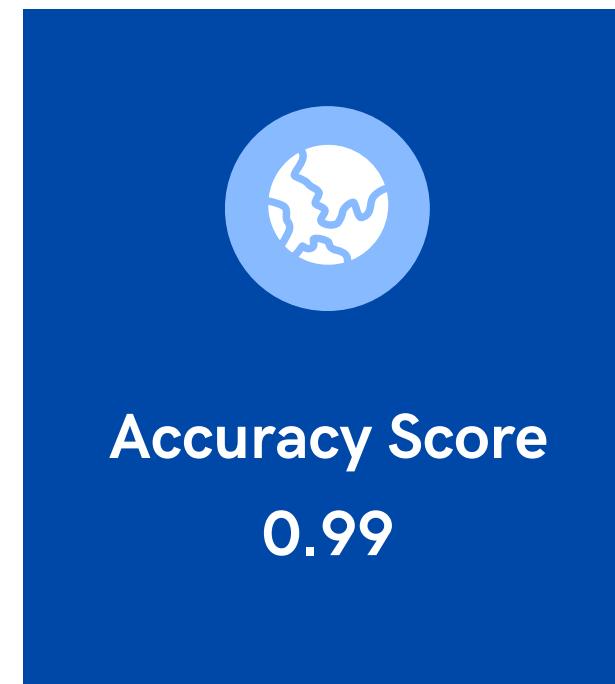
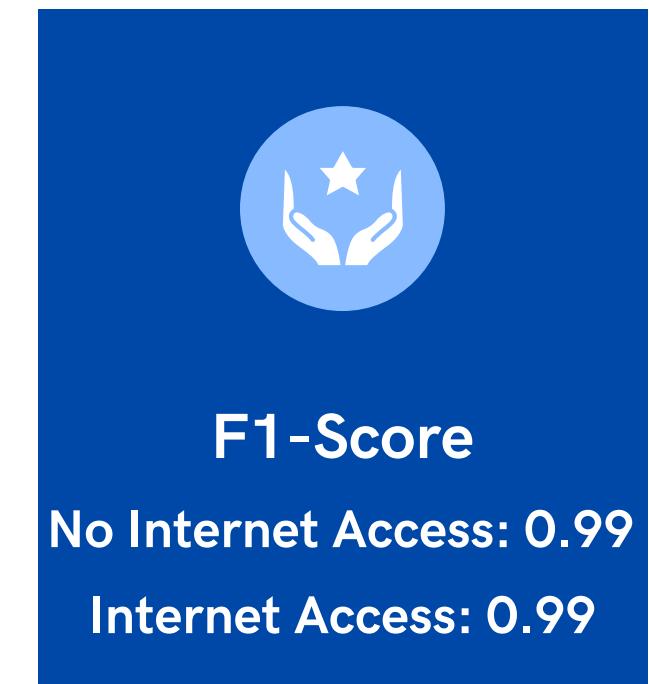
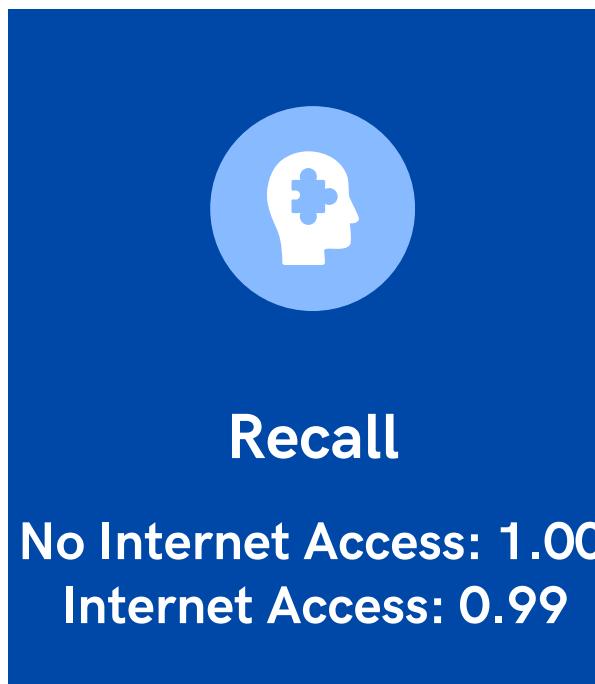
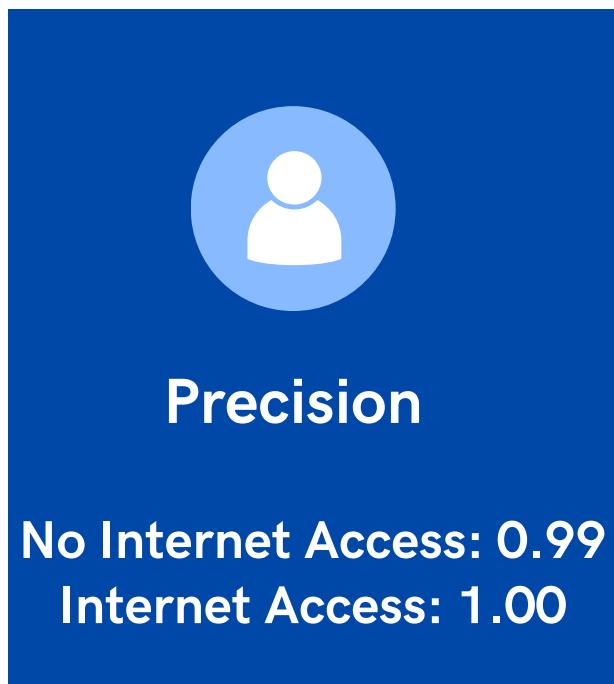
[2018 TECHNOLOGY ACCESS AND ADOPTION SURVEY](#)

Methodology

The final dataset contained 1,483 rows and 81 columns, including respondents whose household income is below \$90,000.



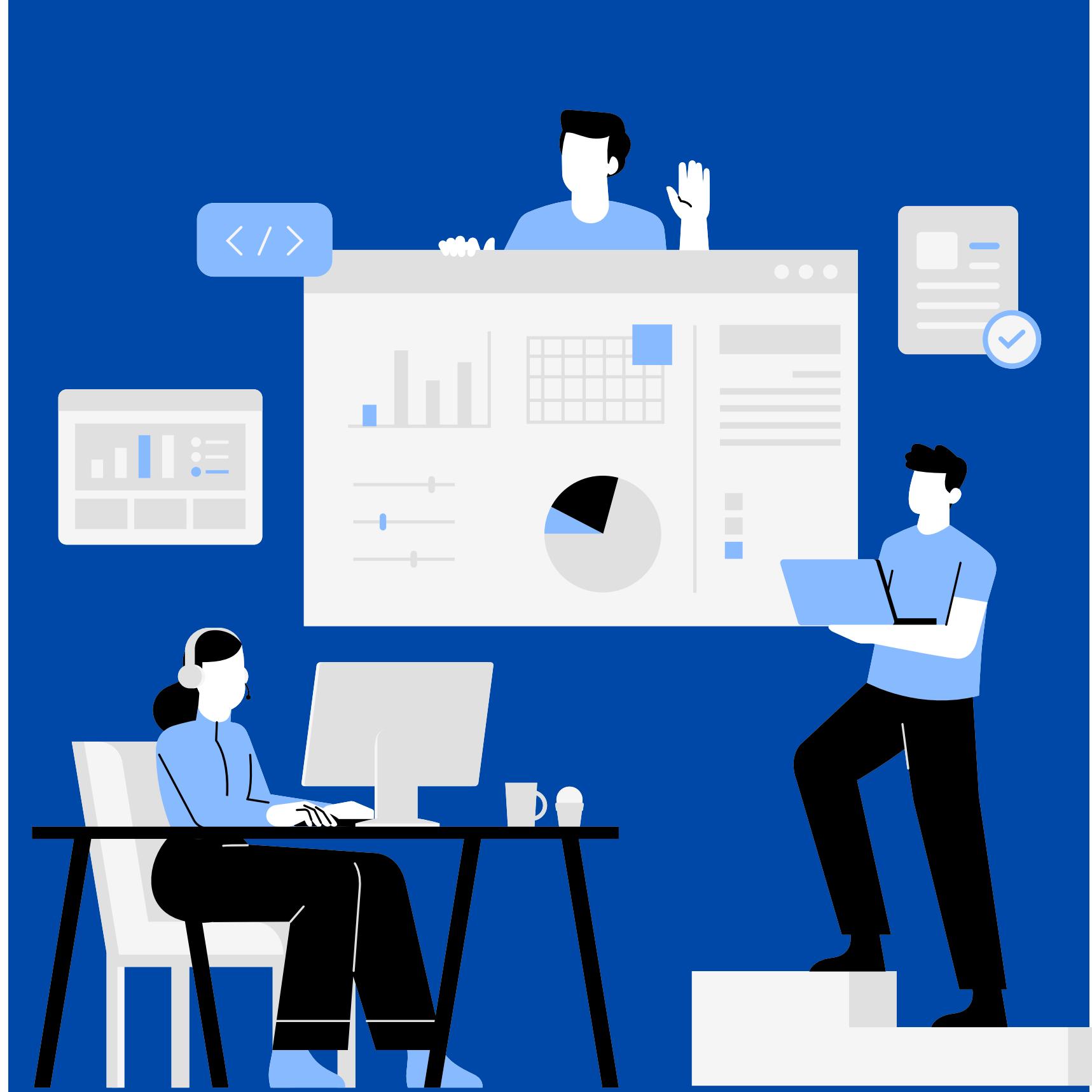
Baseline Model



- Precision: Measures how accurately the model identifies households with internet access and minimizes the number of households predicted not to have internet access.
- Recall: Measures how well the model identifies households with internet access.
- F1-score: Weighted average of precision and recall. A high F1-Score shows the model performs well in identifying households with internet access.
- Accuracy: A high accuracy score shows that the model is correctly classifying most of the households as having or not having internet access.

XGBoost Model

XGBoost (Extreme Gradient Boosting) is a machine learning algorithm used for regression and classification problems.



01 Precision
No Internet Access: 0.97
Internet Access: 0.99

02 Recall
No Internet Access: 0.92
Internet Access: 1.00

03 F1-Score
No Internet Access: 0.95
Internet Access: 0.99

04 Accuracy
0.98

Confusion Matrix

Confusion Matrix (Test Data)

		Confusion Matrix (Test Data)	
		True Label	
True Label	0	True Negative	False Positive
	0	35	3
1	1	False Negative	True Positive
1	1	1	292

True Negative
When it's actually no, how often does it predict no.

False Negative
When it's actually yes, how often does it predict no.

False Positive
When it's actually no, how often does it predict yes.

True Positive
When it's actually yes, how often does it predict yes.

The confusion matrix shows 3 false positives and 1 false negative. The model incorrectly predicted 3 instances of those who do have internet access. The model also incorrectly predicted 1 instance of those who have Internet access as the minority class or those who do not have Internet access.

Feature Importance

FEATURES

Adequate Internet connection speeds

Technology devices

Internet Access

Download Speed

Low-cost
internet
services

0

10

20

30

40

50

FEATURE IMPORTANCE SCORE

Recommendations

Internet should be treated as a public utility

- 01** The survey should be conducted in multiple languages.
- 02** Free in-unit connectivity for low-income households.
- 03** Advertise free or low-cost internet programs.
- 04** Limit the number of survey questions to 10.





Next Steps

To bridge the digital gap among low-income households, it is imperative to collect comprehensive data from all such households in the US. This will enable Congress to take proactive steps towards providing free internet access to these households, complete with sufficient download speeds that are tailored to their respective household sizes and number of devices.

Survey

Focus Groups

Thank you for your time



Brittney Nitta-Lee
Founder

Thank you for your time!



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