

Unlocking Opportunities:

A Data-Driven Path to Alleviate Unemployment in the Philippines

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Agenda

- Introduction and Project Background
- Why It Matters
- The Problem We're Tackling
- How We're Getting Answers
- What We Discovered
- What to Do Next



Topic One

Introduction and Project Background

*** Part of:

- Background and Significance of the Project

Introduction and Background of the Project

The Philippines, a country brimming with potential and resilience, grapples with a significant challenge - unemployment. This issue isn't just about numbers; it's about the dreams and livelihoods of countless Filipinos.

The "**PHL-PSA-LFS-2021-01-PUF**" dataset is a unique resource, providing a comprehensive look at the Philippine labor force. It allows us to delve into the complexities of unemployment, dissect its roots, and imagine potential solutions.

With the data at our fingertips, we can unlock a treasure trove of insights into the nature and causes of unemployment, paving the way for a brighter future for the Philippines.





Topic Two

Why It Matters

*** Part of:

- Background and Significance of the Project
- Motivation and Problem Statement

Why It Matters (continuation...)

The Motivation We're Exploring:

We're on a mission to figure out why some people in the Philippines don't have jobs. But we're not just looking for basic answers; we're out to find some truly interesting and fresh insights.



Why It Matters (continuation...)



Why We're Excited:

Unemployment is a big deal – it affects lots of people and families. But it's not just about numbers; it's about understanding the stories and challenges behind those numbers.



Why It Matters (continuation...)



Our Data-Driven Approach:

The project will use data analytics to identify the factors contributing to unemployment, such as age, sex, education level, and geographic location. It will also identify potential solutions to address the issue.



Why It Matters (continuation...)

Helping People Make Better Choices:

The project's findings can help policymakers and stakeholders efficiently develop solutions such as making of policies and programs that promote job creation, improve education and training programs, and address the skills mismatch between job seekers and employers.





Topic Three

The Problem We're Tackling

*** Part of:

- Motivation and Problem Statement

The Problem We're Tackling (continuation...)

Portraying the Unemployment Landscape:

(Descriptive Analytics)

- What is the current unemployment rate in the Philippines, and how has it changed over time?
- What are the top and bottom primary occupations in need of assistance when people are searching for employment?



The Problem We're Tackling (continuation...)

Diagnosing the Unemployment Ailments:

(Diagnostic Analytics)

- Why is there a variation in employment status among different demographic in the Philippines, and are there specific factors contributing to this discrepancy?
- Why do different age groups have their unique ways of job hunting, and can we figure out what's causing these differences?



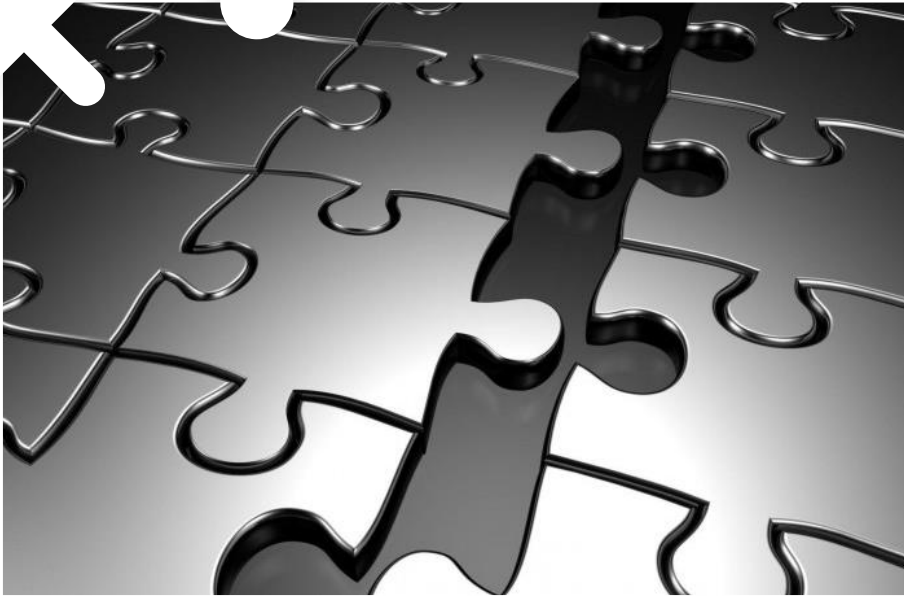
The Problem We're Tackling (continuation...)

Predicting the Future of Unemployment:

(Predictive Analytics)

- Can we predict the likelihood of an individual in the Philippines being employed or unemployed, and what factors have the most significant impact on their employment status?





Topic Four

How We're Getting Answers

*** Part of:

- Methodology

How We're Getting Answers

The project will use the PHL-PSA-LFS-2021-01-PUF dataset and other related datasets, which provides information on the Philippine labor force.

Descriptive analytics will be used to understand the characteristics of unemployed Filipinos.


Predictive analytics will be used to predict future unemployment rates.



The dataset will be cleaned to remove any errors or inconsistencies.

Diagnostic analytics will be used to identify the factors that contribute to unemployment in the Philippines.

Recommendations for policies and programs that can be implemented to reduce unemployment in the Philippines.



The way to get
started is to quit
talking and
begin doing.

Walt Disney



Topic Five

What We Discovered

*** Part of:

- Results and Findings

What We Discovered (continuation...)

Portraying the Unemployment Landscape:

(Descriptive Analytics)

- What is the current unemployment rate in the Philippines, and how has it changed over time?
- What are the top and bottom primary occupations in need of assistance when people are searching for employment?



What We Discovered...

Portraying the Unemployment Landscape: (Descriptive Analytics)

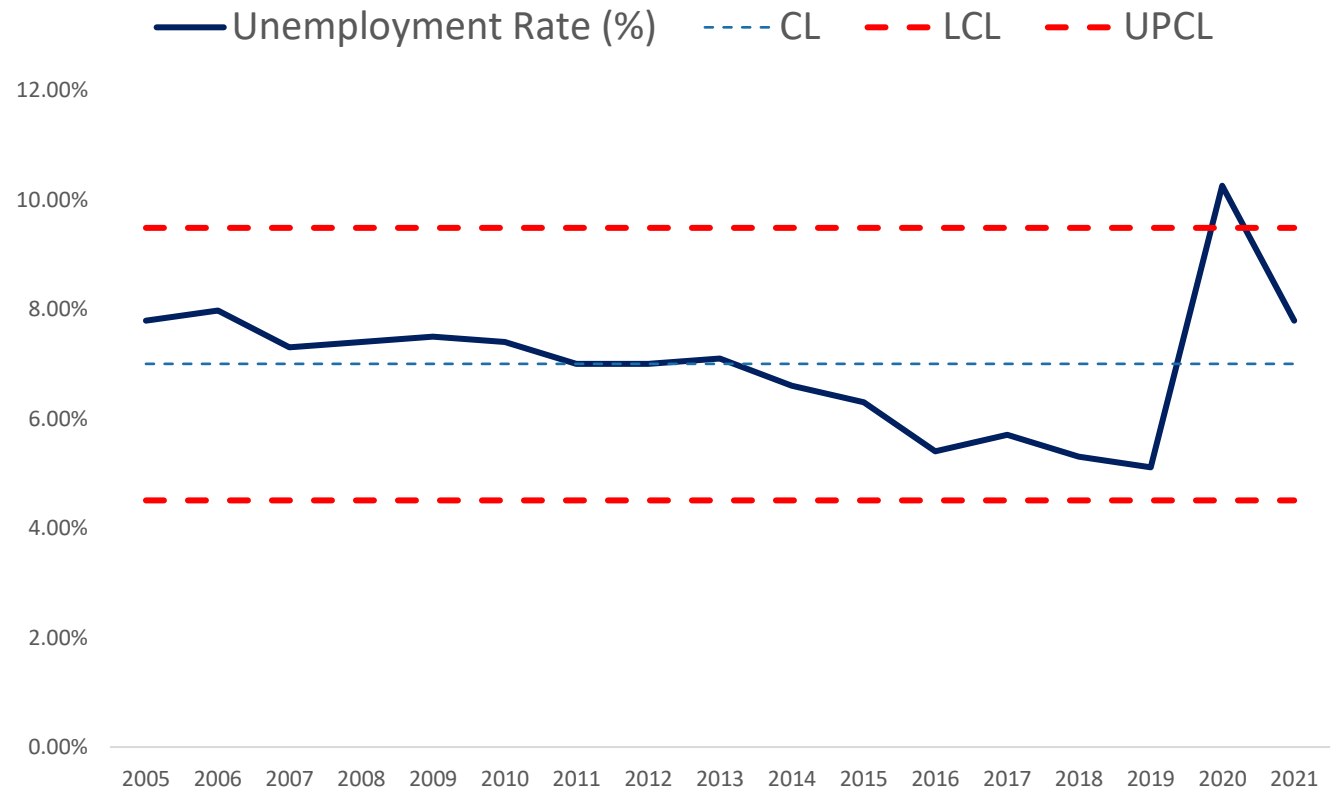
- What is the current unemployment rate in the Philippines, and how has it changed over time?

The unemployment rate declined steadily from 2005 to 2019 with small fluctuations between 6% and 8.0% until reaching a low of 5.11% in 2019.

But in 2020, we can observe that the rate shot up to 10.26%, likely due to the economic impact of the COVID-19 pandemic.

Lots of people lost their jobs, which isn't surprising given the circumstances.

In 2021, the unemployment rate returned to a level (7.79%) closer to the historical average, indicating a degree of economic recovery from the pandemic's impact.



Control Chart Analysis

What We Discovered...

Portraying the Unemployment Landscape: (Descriptive Analytics)

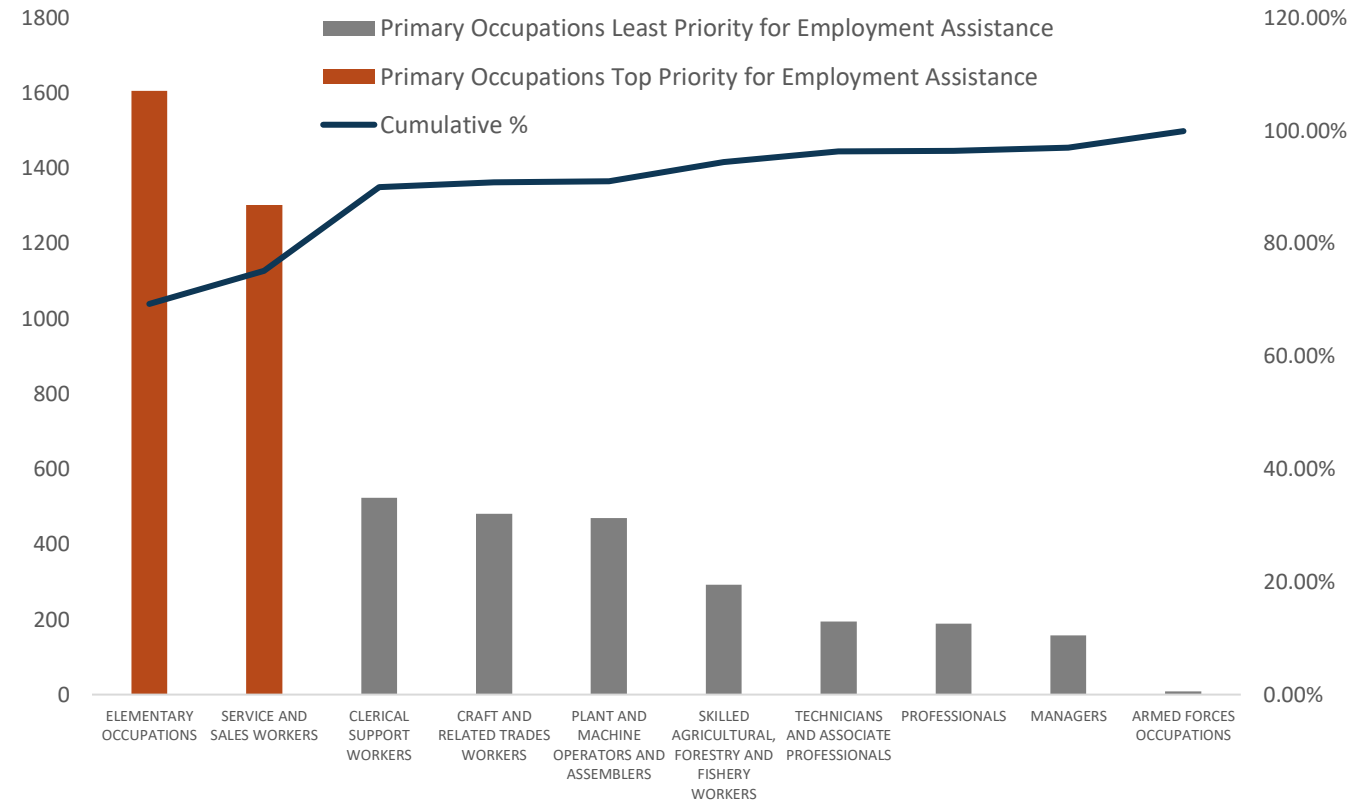
- What are the top and bottom primary occupations in need of assistance when people are searching for employment?

The Pareto chart shows that the top two primary occupations in need of assistance when people are searching for employment are "ELEMENTARY OCCUPATIONS" and "SERVICE AND SALES WORKERS".

These two occupations account for 80% of the targeted unemployed occupations.

The bottom two primary occupations in need of assistance when people are searching for employment are "MANAGERS" and "ARMED FORCES OCCUPATIONS".

These two occupations account for less than 3% of the targeted unemployed occupations.



Pareto Chart Analysis

What We Discovered (continuation...)



Diagnosing the Unemployment Ailments:

(Diagnostic Analytics)

- Why is there a variation in employment status among different demographic in the Philippines, and are there specific factors contributing to this discrepancy?
- Why do different age groups have their unique ways of job hunting, and can we figure out what's causing these differences?



What We Discovered...

Diagnosing the Unemployment Ailments: (Diagnostic Analytics)

- Why is there a variation in employment status among different demographic in the Philippines, and are there specific factors contributing to this discrepancy?

By using a Chi-square test, the results found that “where you live (region)”, “how much education you have”, and “whether you've completed technical or vocational training” are all very important in deciding whether you have a job or not in the Philippines.

In simpler terms, these factors really matter. They can determine whether you're more likely to have a job or not.

Depending on your background in these areas, you're more or less likely to be employed. It's like these factors hold the keys to your job opportunities in the Philippines.

P-Value	Significance Level	Interpretation
< 0.001	Highly Significant	The relationship between the two variables is very unlikely to be due to chance.
0.001 - 0.01	Significant	The relationship between the two variables is unlikely to be due to chance.
0.01 - 0.05	Marginally significant	The relationship between the two variables may be due to chance, but it is also possible that there is a real relationship.
> 0.05	Not significant	There is no evidence of a relationship between the two variables.

Chi-square Test of Independence



Chi-square Test of Independence

Region Demographic Profile	Highest Grade Completed	Technical/Vocational Graduate
<div>LEVEL OF SIGNIFICANCE: 0.05 P-VALUE: 8.49E-177 CONCLUSION: REJECT NULL HYPOTHESIS</div> <div><p>This means that the geographic region where individuals are located plays a substantial role in determining whether they are employed or not.</p><p>Different regions in the Philippines may have varying levels of economic activity, industries, and job opportunities, leading to distinct employment outcomes.</p></div>	<div>LEVEL OF SIGNIFICANCE: 0.05 P-VALUE: 0.00E+00 CONCLUSION: REJECT NULL HYPOTHESIS</div> <div><p>This implies that the level of education individuals have achieved is a crucial factor in determining their employment status.</p><p>Those with higher levels of education may have better skills and qualifications, making them more employable.</p></div>	<div>LEVEL OF SIGNIFICANCE: 0.05 P-VALUE: 1.31E-189 CONCLUSION: REJECT NULL HYPOTHESIS</div> <div><p>This suggests that individuals who have completed technical or vocational courses have distinct employment patterns.</p><p>Such courses often equip individuals with practical skills, making them well-suited for specific job opportunities.</p></div>

What We Discovered...

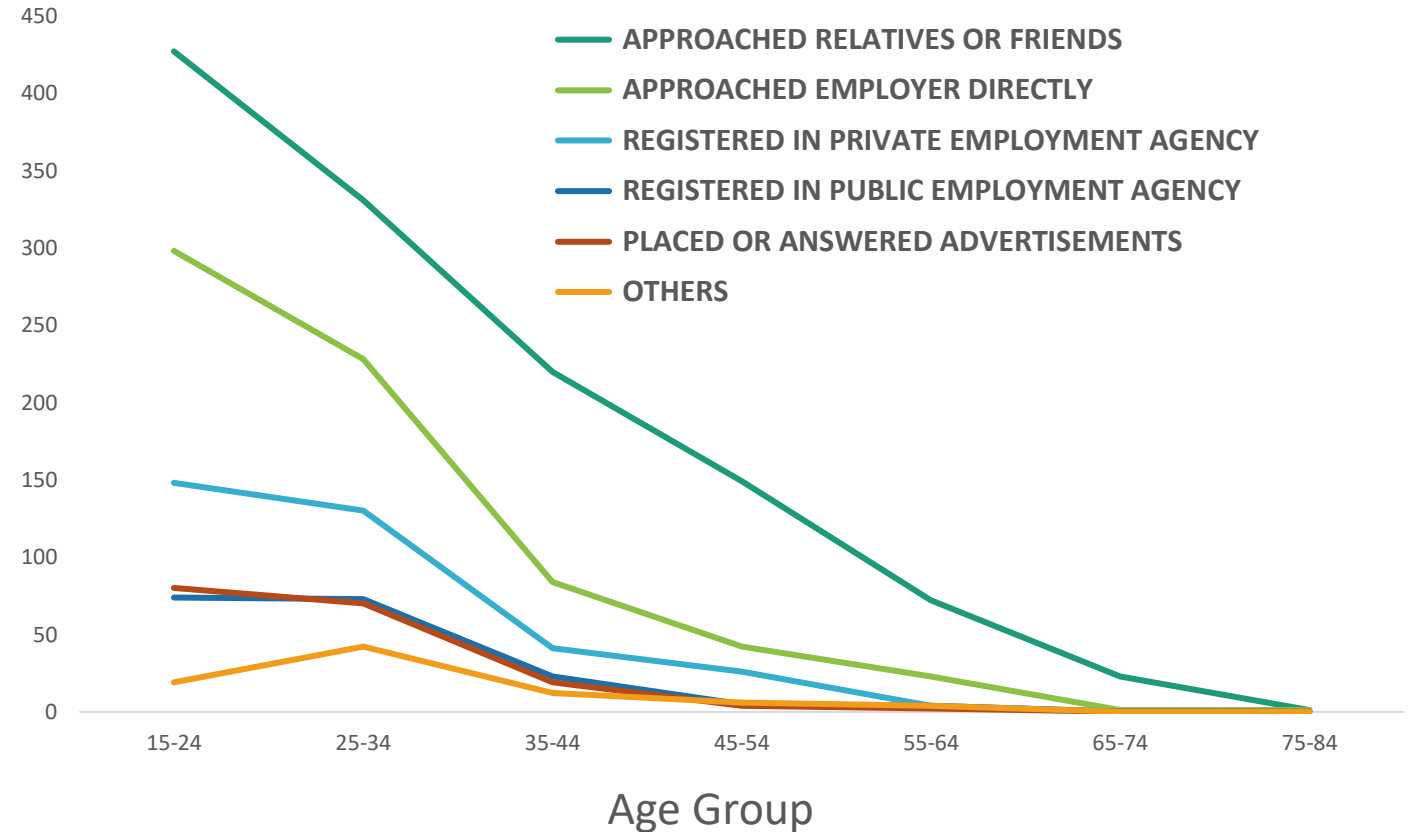
Diagnosing the Unemployment Ailments: (Diagnostic Analytics)

- Why do different age groups have their unique ways of job hunting, and can we figure out what's causing these differences?

The graph shows how people of different ages seek jobs. What's intriguing is that 'Asking relatives or friends' is a popular choice across all age groups.

Now, we'll use a statistical tool called One Way ANOVA to dig deeper. ANOVA helps us determine if the differences in job search methods among age groups are meaningful or just random.

This is important because it helps us figure out if people's ages genuinely influence how they search for jobs or if there are other factors at play.



One Way Analysis of Variation (ANOVA)

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
REGISTERED IN PUBLIC EMPLOYMENT AGENCY	179	5089	28.43	67.90
REGISTERED IN PRIVATE EMPLOYMENT AGENCY	349	10003	28.66	73.03
APPROACHED EMPLOYER DIRECTLY	677	19690	29.08	98.18
APPROACHED RELATIVES OR FRIENDS	1223	40127	32.81	165.64
PLACED OR ANSWERED ADVERTISEMENTS	175	4703	26.87	55.35
OTHERS	83	2616	31.52	100.33

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	12182.73822	5	2436.547644	20.14557101	8.85576E-20	2.217435855
Within Groups	324138.1285	2680	120.9470629			
Total	336320.8667	2685				

LEVEL OF SIGNIFICANCE:

0.05

P-VALUE:

8.86E-20

CONCLUSION:

REJECT NULL HYPOTHESIS

The ANOVA result, with an extremely small p-value (8.86E-20), shows a significant difference in how people of different ages search for jobs. It's not random; there's a clear pattern at play.

When we say we reject the "NULL" hypothesis, it means that people of different ages do indeed have their unique ways of job hunting.

Therefore, the ANOVA analysis confirms there's a real, substantial connection and relationship in the data and it's not arbitrary.

This confirmation is very valuable because it can be used to develop more effective programs and services to help job seekers of all ages effectively.

What We Discovered (continuation...)

Predicting the Future of Unemployment:

(Predictive Analytics)

- Can we predict the likelihood of an individual in the Philippines being employed or unemployed, and what factors have the most significant impact on their employment status?



What We Discovered...

Portraying the Unemployment Landscape: (Descriptive Analytics)

- Can we predict the likelihood of an individual in the Philippines being employed or unemployed, and what factors have the most significant impact on their employment status?

We used logistic regression analysis to predict the likelihood of an individual in the Philippines being employed or unemployed.

This method predicts the probability of a binary outcome variable based on one or more predictor variables.

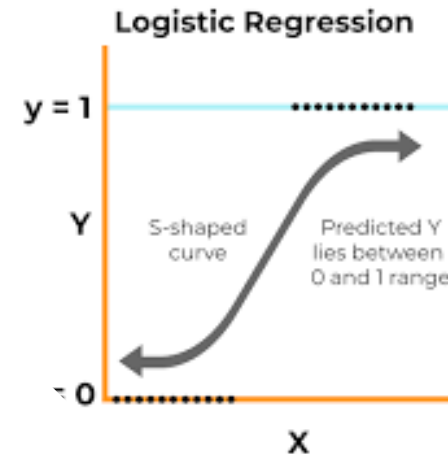
The output provides coefficients, estimates, and odds ratios for each predictor variable, which helps us identify the key factors that impact employment status.

This information can be used to create targeted strategies to alleviate unemployment in the country.

$$Y_i = \beta_0 + \beta_1 X_i + \epsilon_i$$

Labels in the diagram:

- Dependent Variable: Y_i
- Population Y intercept: β_0
- Population Slope Coefficient: β_1
- Independent Variable: X_i
- Random Error term: ϵ_i
- Linear component: $\beta_0 + \beta_1 X_i$
- Random Error component: ϵ_i



Logistic Regression Model

	Coefficients	Variables	Estimates	Odds Ratio
		INTERCEPT	0.091423656	
b0		PUFC05_AGE	0.023314008	1.023587904
b1		PUFURB2015	-0.161785847	0.850623348
b2		PUFC04_SEX	-0.196112299	0.821919928
b3		PUFC06_MSTAT_SINGLE	0.506849002	1.660052124
b4		PUFC06_MSTAT_MARRIED	0.607061469	1.835031172
b5		PUFC06_MSTAT_WIDOWED	-0.202328026	0.816826944
b6		PUFC06_MSTAT_DIVORCE/SEPARATE	0.097876791	1.102826899
b7		PUFC06_MSTAT_ANNULLED	0.000445723	1.000445823
b8		PUFC09_GRADTECH	0.258314203	1.294745568
b9		PUFC09A_NFORMAL	-0.062156235	0.939736055
b10		PUFC07_GRADE_GRADUATE	1.231659459	3.426911639
b11		PUFC07_GRADE_UNDERGRADUATE	1.268385237	3.555107271

Logistic Regression Model

$$\begin{aligned} \text{Logit}(P) = & 0.0914 + 0.0233X_1 - 0.1618X_2 - 0.1961X_3 \\ & + 0.5068X_4 + 0.6071X_5 - 0.2023X_6 + 0.0979X_7 \\ & + 0.0004X_8 - 0.0622X_9 + 1.2317X_{10} + 1.2684X_{11} \end{aligned}$$

Here's what we found:

- **Age Matters:** The older you are, the more likely you are to have a job. It's a 2.36% increase in your chances for every year older.
- **City or Countryside:** If you live in the city, you're a bit more likely to be employed than if you live in the countryside.
- **Gender Impact:** Being male slightly decreases your chances of having a job compared to being female.
- **Marital Status:** Whether you're single or married matters. Single people have higher odds of employment, while married folks have even better odds.
- **Education Counts:** Your education level is super important. If you're a graduate or an undergraduate, you have much better odds of having a job compared to others.



Topic Six

What to Do Next

*** Part of:

- Conclusions and Recommendations

Portraying the Unemployment Landscape

Unemployment Rate:

- The unemployment rate in the Philippines was steadily decreasing from 2005 to 2019, hovering between 6% and 8.0%. In 2019, it reached a low of 5.11%.
- However, due to the economic impact of the COVID-19 pandemic in 2020, the rate surged to 10.26%. Thankfully, in 2021, it improved to 7.79%, indicating some recovery from the pandemic's effects.

Conclusion & Recommendation:

- The unemployment rate in the Philippines has been going down in recent years. But when the COVID-19 pandemic hit, a lot of people lost their jobs, and the unemployment rate went up.
- Last year, the unemployment rate went back down, but it's still higher than it was before the pandemic.
- To maintain this positive trend and further reduce unemployment, it's crucial to focus on economic recovery efforts, job creation, and support for those who lost their jobs during the pandemic.
- The government and businesses should collaborate on initiatives that stimulate economic growth, leading to more job opportunities for the people of the Philippines.

Portraying the Unemployment Landscape

Unemployed Occupations:

- The primary occupations most in need of assistance are "ELEMENTARY OCCUPATIONS" and "SERVICE AND SALES WORKERS," representing 80% of targeted unemployed occupations.
- "MANAGERS" and "ARMED FORCES OCCUPATIONS" are the bottom primary occupations in need of assistance, accounting for less than 3% of targeted unemployed occupations.

Conclusion & Recommendation:

- To address unemployment effectively, resources and support should be focused on high-need primary occupations, such as "ELEMENTARY OCCUPATIONS" and "SERVICE AND SALES WORKERS."
- Strategies for "MANAGERS" and "ARMED FORCES OCCUPATIONS" should be also tailored to their specific needs.
- On the other hand, targeted programs would be the best that can address their specific needs and enhance their employability.

Diagnosing Employment Discrepancies

Factors Impacting Employment:

- Geographic region, education level, and completion of technical or vocational training significantly impact employment status in the Philippines.

Conclusion & Recommendation:

- The chances of getting a job in the Philippines vary depending on where you live, how much education you have, and whether you've completed technical or vocational training.
- To address unemployment disparities, strategies should consider these demographic factors.
- This could include investing in less developed regions, providing financial assistance for education and training, and developing job training programs that meet the needs of different industries and regions.

Diagnosing Employment Discrepancies

Age & Job Search Patterns:

- Age plays a significant role in how people search for jobs in the Philippines.
- Different age groups look for jobs in different ways. This is real and not just a coincidence.

Conclusion & Recommendation:

- To better support job seekers of all ages, it's essential to recognize these age-related differences in job search methods.
- Tailored job-seeking programs and services should be developed to address the specific needs and preferences of each age group.
- For example, programs for younger job seekers might focus on online job platforms, while those for older job seekers could emphasize networking and traditional job search methods.
- Understanding these distinctions can lead to more effective strategies for assisting job seekers across different age groups.

Predicting Employment Status

Logistic Regression Analysis:

- The Logistic Regression Analysis shows that in the Philippines, some things really affect if you have a job or not. Like, if you're older, you're more likely to have a job.
- Also, living in the city makes it a bit easier to find a job, and having more education really boosts your chances of having a job.

Conclusion & Recommendation:

- The findings of this analysis can be used to create targeted strategies to alleviate unemployment in the country.
- For instance, the government can focus on providing education and training programs to improve the skills of the unemployed population.
- They can also create job opportunities in urban areas to increase the chances of employment for people living in rural areas.
- The government could do this by providing job training and placement services, and by investing in education and infrastructure.



Summary

In a nutshell, the data and insights we've gathered provide valuable guidance for the government and various organizations. They can use this information to develop more effective programs and policies aimed at reducing unemployment and ensuring that job opportunities are accessible to all in the Philippines.

By understanding the key factors that influence employment, we can work towards a brighter, more inclusive job landscape.



Thank You

Juven Dale Q. Colaste
Project SPARTA Scholar – Data Scientist Pathway

