PRESENTATION DECK

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:

- Introduction and Background of the Project

Introduction and Background of the Project

The Philippines, a country brimming with potential and resilience, grapples with a significant challenge of 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:

- Objectives and Significance of the Project

Why It Matters (continuation…)

The Motivation We're Exploring:

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 We're Excited:

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.

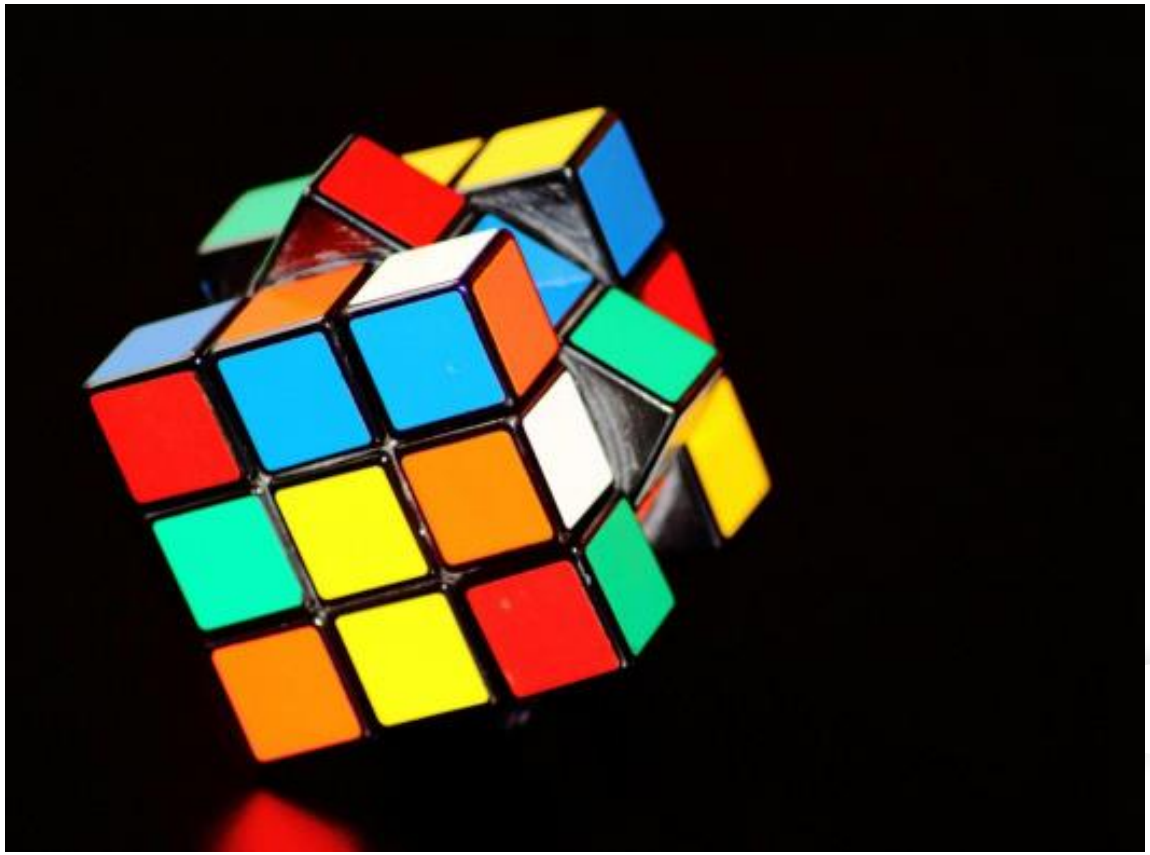
Why It Matters (continuation…)

Our Data-Driven Approach:

The project will use advanced data analytics to identify the factors contributing to unemployment, such as age, sex, education level, and geographic location.

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:

- Statement of the Problem

The Problem We're Tackling (continuation…)

<u>Portraying the Unemployment Landscape:</u>

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

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

The Problem We're Tackling (continuation…)

<u>Diagnosing the Unemployment Ailments:</u>

• 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…)

<u>Predicting the Future of Unemployment:</u>

• 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, Analyses and Limitations

How We're Getting Answers

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

We'll use descriptive analytics, including control chart and Pareto chart analysis, to gain insights and understand the challenges faced by unemployed Filipinos.

We'll employ predictive analytics through logistic regression to identify and assess factors influencing the likelihood of future unemployment.

We'll clean the dataset by removing errors or inconsistencies, import metadata, and reduce data noises.

We'll use diagnostic analytics like the Chi-square test and One-way ANOVA to pinpoint the factors contributing to unemployment in the Philippines.

We will explore and suggest policies and programs aimed to mitigate or reduce unemployment in the Philippines.

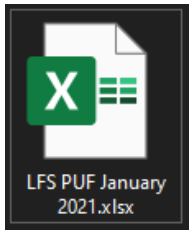
Data Collection …

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

Getting the right data for my capstone project was a headache. I had decided to work on "unemployment" national issue, and by using data from the Philippines would be the key to finding a solution. But it was quite a journey.

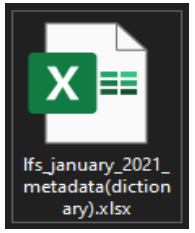
I went hunting for data on various government websites, and I collected a whopping 100+ datasets.

After sifting through all that information, I finally settled on three (3) datasets you can see on the right.



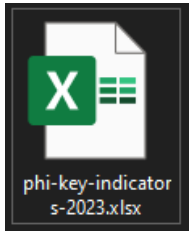
Data Source: https://psada.psa.gov.ph

The "LFS PUF January 2021" is a quarterly survey of households in all parts of the country (in this case, 1st quarter – January 2021). It's the collected data on the demographic and socio-economic characteristics of all residents aged 15 and over, regardless of their sex, race, religion, citizenship, marital status, educational attainment, or economic status.



Data Source: https://psada.psa.gov.ph

The "lfs_january_2021_metadata" dictionary holds information about the" LFS PUF January 2021". It has the details about the dataset and structure, making it easier to understand and work with the survey results.



Data Source: https://www.adb.org/

The "phi-key-indicators-2023" contains essential information and statistics about the Philippines from year 2000 to 2023. This data cover various key aspects such as the economy, population, and other important factors that provide an overview of the country's status in that year.


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

Topic Five

What We Discovered

*** Part of:

- Analyses, Results and Discussion

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?

By using Control Chart Analysis, we can determine the unusual patterns in our employment rate.

The "CL" (Center Line) is like the expected or normal rate (7.00%). It's the normally accepted target.

The "LCL" (Lower Control Limit) is like the minimum acceptable rate (4.50%).

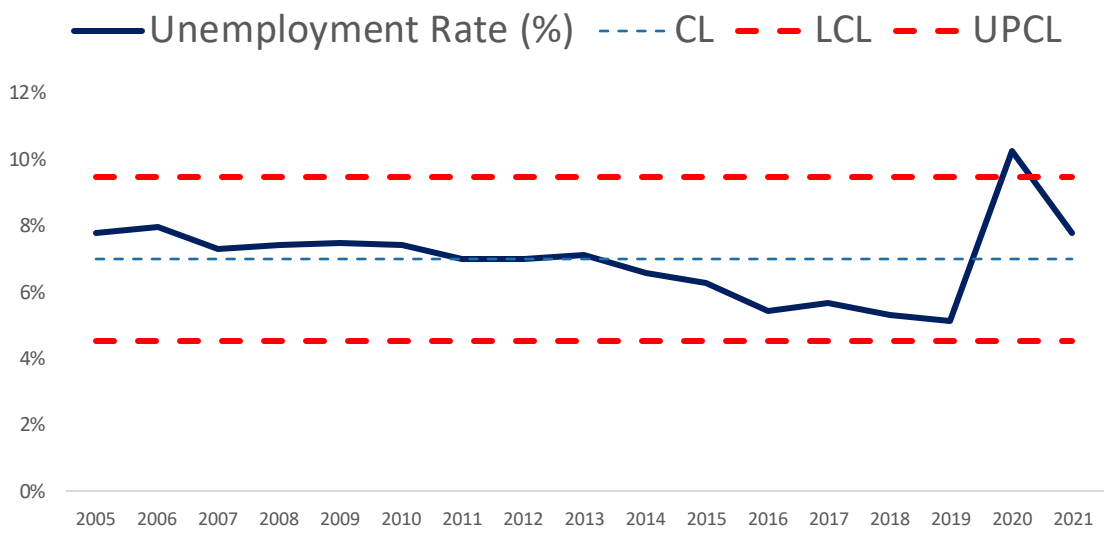
The "UPCL" (Upper Control Limit) is like the maximum acceptable rate (9.49%).

This means that the data points should ideally stay between the LCL and UPCL, with the CL in the middle.

If they go outside these lines, it could mean something unusual is happening.

Control Chart Analysis

Year	LABOR FORCE ('000)	Unemployment Rate	CL	LCL	UPCL
2005	35,287.00	8%	7%	5%	9%
2006	35,464.14	8%	7%	5%	9%
2007	36,213.00	7%	7%	5%	9%
2008	36,804.00	7%	7%	5%	9%
2009	37,893.00	8%	7%	5%	9%
2010	38,893.00	7%	7%	5%	9%
2011	40,006.00	7%	7%	5%	9%
2012	40,427.00	7%	7%	5%	9%
2013	41,022.00	7%	7%	5%	9%
2014	41,379.00	7%	7%	5%	9%
2015	41,343.00	6%	7%	5%	9%
2016	43,361.00	5%	7%	5%	9%
2017	42,775.00	6%	7%	5%	9%
2018	43,459.91	5%	7%	5%	9%
2019	44,197.12	5%	7%	5%	9%
2020	43,878.16	10%	7%	5%	9%
2021	47,703.20	8%	7%	5%	9%



Overall Findings:

- Prior to 2020, indications of economic stability is observed due to a steady decline in unemployment rate (2005 to 2019) with fluctuations between lower and upper control limit.
- Sharp increase in unemployment rate in 2020 due to COVID-19 pandemic that went above the upper limit.
- Importance of understanding and preparing for unforeseen events that can disrupt economic stability.

Control Chart Analysis (Discussion)

At the table and chart, the unemployment rate declined steadily from 2005 to 2019 with small fluctuations between lower and upper control limit until reaching a low of 5.11% in 2019.

However, in 2020, the unemployment rate (10.26%) went above the upper limit. This indicates an issue, and this means a thorough investigation is needed to determine the cause of this high rate.

Upon further investigation, we commonly know that at 2020, the world faced an unprecedented challenge in the form of the COVID-19 pandemic.

The pandemic had far-reaching effects on the global and local economy, leading to business closures, job losses, and economic uncertainty. This event likely played a significant role in the sharp increase in the unemployment rate in that year.

Also, this means that the data suggests that prior to 2020, the economy had been relatively stable, with the unemployment rate staying within a manageable range.

However, the sudden spike in 2020 highlights the importance of understanding and preparing for unforeseen events that can disrupt economic stability.

What We Discovered…

Portraying the Unemployment Landscape:
(Descriptive Analytics)

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

A Pareto Chart is like focusing on the most significant problems to solve first, which is in line with the Pareto Principle stating that 80% of the effects come from 20% of the causes.

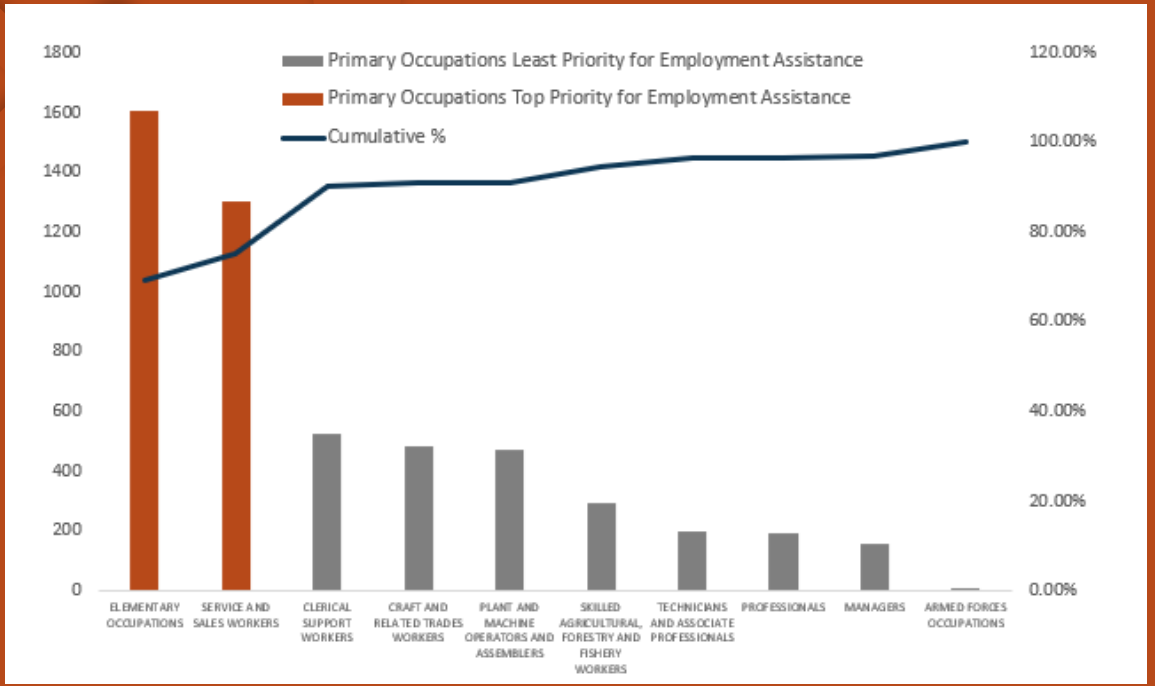
In this case, we have a list of "Primary Occupations" along with the number of unemployed in each occupation.

The "Cumulative %" on the right shows the combined impact of these occupations on unemployment.

And the 80% target means that we aim to address the primary causes (occupations) contributing to at most 80% of the overall unemployment problem.

Pareto Chart Analysis

Primary Occupations	Unemployed	Top Priority	Least Priority	Cumulative %
ELEMENTARY OCCUPATIONS	1,606.00	1606	-	69%
SERVICE AND SALES WORKERS	1,302.00	1302	-	75%
CLERICAL SUPPORT WORKERS	523.00	-	523	90%
CRAFT AND RELATED TRADES WORKERS	481.00	-	481	91%
PLANT AND MACHINE OPERATORS AND ASSEMBLERS	470.00	-	470	91%
SKILLED AGRICULTURAL, FORESTRY AND FISHERY WORKERS	293.00	-	293	94%
TECHNICIANS AND ASSOCIATE PROFESSIONALS	195.00	-	195	96%
PROFESSIONALS	189.00	-	189	96%
MANAGERS	157.00	-	157	97%
ARMED FORCES OCCUPATIONS	8.00	-	8	100%
GRAND TOTAL	5,224.00		Target:	80%



Overall Findings:

- “Elementary Occupations” and “Service and Sales Workers” account for 75% of total unemployment.
- This means that a large proportion of unemployed individuals are found in the above two occupational groups.
- Other occupations have notably smaller contributions to the overall unemployment rate.

Pareto Chart Analysis (Discussion)

At the table and chart, it's evident that the primary contributors to the overall unemployment issue are the occupations of "Elementary Occupations" and "Service and Sales Workers."

Together, these two categories account for a significant share of the unemployment rate, making up as much as 75% of the total unemployment among all the listed occupations.

This means that a large proportion of people without jobs are found in these two occupational groups.

In simpler terms, if we were to group all the unemployed individuals by their primary occupation, we’ll find that the majority fall into either "Elementary Occupations" or "Service and Sales Workers."

In contrast, the remaining occupations listed on the chart have notably smaller contributions to the overall unemployment rate.

While they still play a part in the unemployment issue, their impact is relatively minor compared to the significant presence of unemployed individuals in the "Elementary Occupations" and "Service and Sales Workers" categories.

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?

Through the use of a Chi-square test, we can identify crucial factors that have a substantial impact on employment status in the Philippines.

We assess their significance through the p-values generated in our Chi-square test of independence.

In simpler terms, these significant factors hold great importance as they have the power to influence whether you are more likely to secure a job or not.

Depending on our background related to these significant factors, our chances of employment can vary.

Think of these significant factors as the keys that unlock or restrict job opportunities in the Philippines

Chi-square Test of Independence

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

Region Demographic Profile

LEVEL OF SIGNIFICANCE:	0.05
P-VALUE:	8.49E-177
CONCLUSION:	REJECT NULL HYPOTHESIS

"Reject null hypothesis" means that the statistical analysis has shown that there is a significant relationship between the region profile and their employment status due to the significantly small “8.49E-177” p-value.

In simpler terms, it confirms that where you live has a meaningful impact on whether you have a job or not.

Different regions in the Philippines may have varying levels of economic activity, industries, and job opportunities, leading to distinct employment outcomes.

Highest Grade Completed

LEVEL OF SIGNIFICANCE:	0.05
P-VALUE:	0.00E+00
CONCLUSION:	REJECT NULL HYPOTHESIS

"Reject null hypothesis" means that the statistical analysis has revealed a significant relationship between the highest grade completed and employment status due to the significantly small “0.00E+00” p-value.

In simpler terms, it confirms that the level of education you attain significantly influences whether you have a job or not.

Those with higher levels of education may have better skills and qualifications, making them more employable.

Technical Vocational Graduate

LEVEL OF SIGNIFICANCE:	0.05
P-VALUE:	1.31E-189
CONCLUSION:	REJECT NULL HYPOTHESIS

"Reject null hypothesis" means that the statistical analysis has shown a significant relationship between completing technical or vocational courses and employment status due to the significantly small “1.31E-189” p-value.

In simpler terms, it confirms that completing these courses significantly influences whether you have a job or not.

This suggests that individuals who have completed technical or vocational courses have distinct employment patterns.

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?

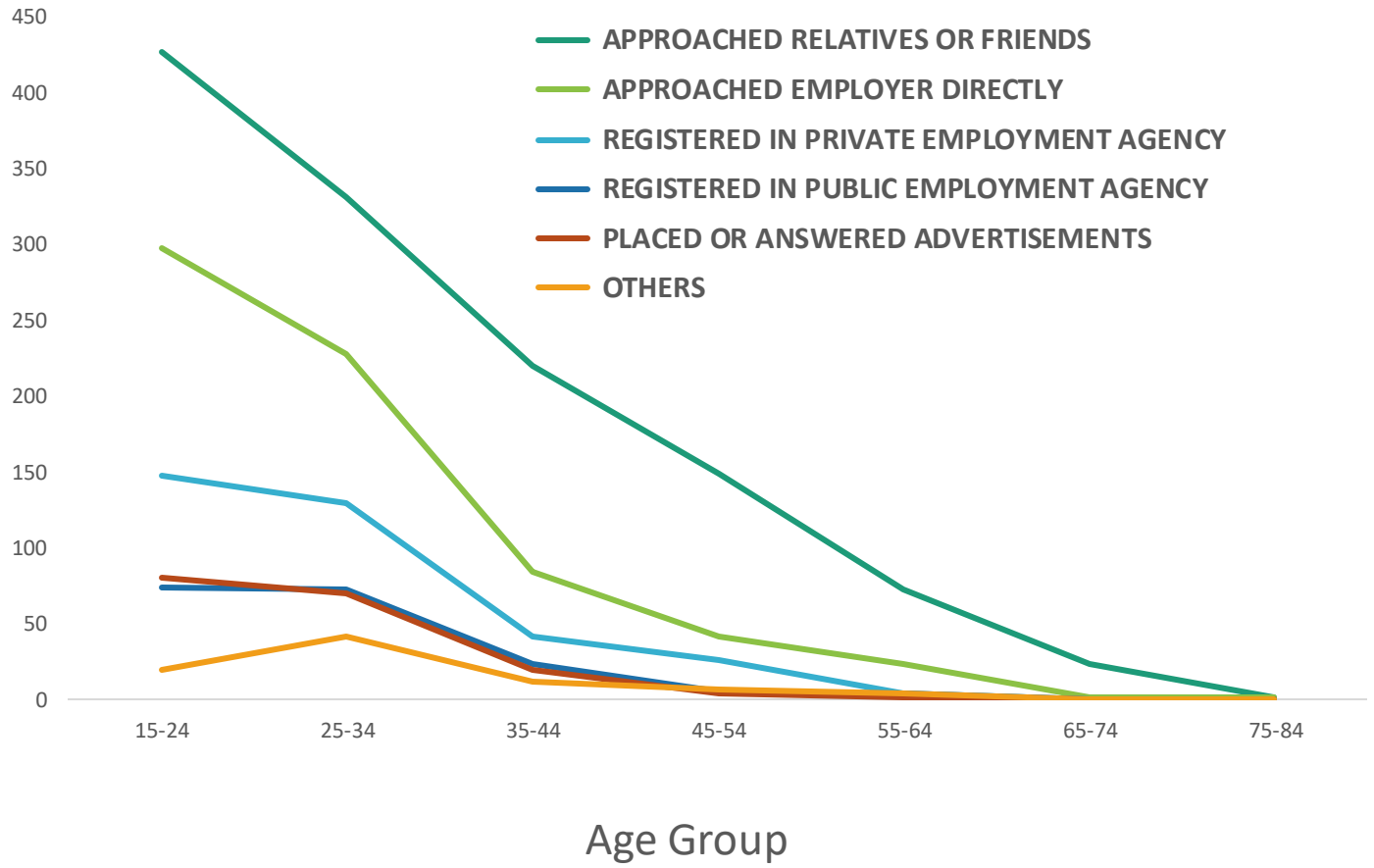
Much like the Chi-square test helps uncover vital factors influencing employment status in the Philippines, we use a statistical tool called One Way ANOVA to explore the distinct job-hunting behaviors across different age groups.

ANOVA, or Analysis of Variance, goes beyond surface-level observations and assesses whether the differences in job search methods among age groups carry genuine significance or are mere chance variations.

This is a valuable exploration because it aids us in discerning whether a person's age genuinely shapes their job search techniques or if there are deeper underlying factors at play.

By employing ANOVA, we gain valuable insights into the intricate relationship between age and job search behaviors.

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

Overall Findings:

- ANOVA reveals significant and non-random differences in job search methods across different age groups. (p-value = 8.86E-20)
- People of different age groups exhibit unique and distinct job hunting behaviors.
- Age has a significant influence on how people search for jobs.
- "Between Groups" and "Within Groups" distinctions showcase differences in job search methods among categories and within each group, respectively.

One Way ANOVA (Discussion)

The ANOVA analysis results are quite remarkable.

In this ANOVA analysis, we're checking how different groups approach job searching. The groups include those who register in public or private employment agencies, approach employers directly, seek help from relatives or friends, respond to advertisements, or use other methods.

Looking at the results, we see two main parts: "Between Groups" and "Within Groups." "Between Groups" shows differences in job search methods among these categories, while "Within Groups" considers differences within each group.

The low p-value (8.86E-20) and significant F-value (20.15) indicate that the diverse job search methods among these groups are not random; there's a real difference. By rejecting the null hypothesis, we confirm that these groups indeed have unique approaches to job searching.

In simpler terms, this analysis tells us that people in these categories don't search for jobs in the same way, and this understanding can help create targeted strategies to assist them better.

What We Discovered…

<u>Predicting the Future of Unemployment:</u>
(Predictive Analytics)

• Can we predict the likelihood of an individual in the Philippines being employed or unemployed?

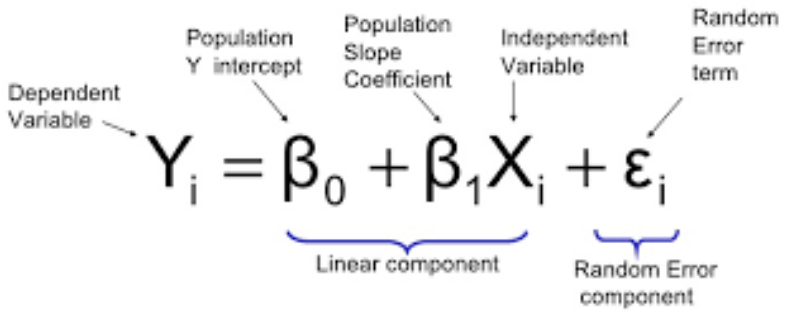
We used logistic regression analysis to predict the likelihood of a binary outcome – in this case, whether a person will find employment or not.

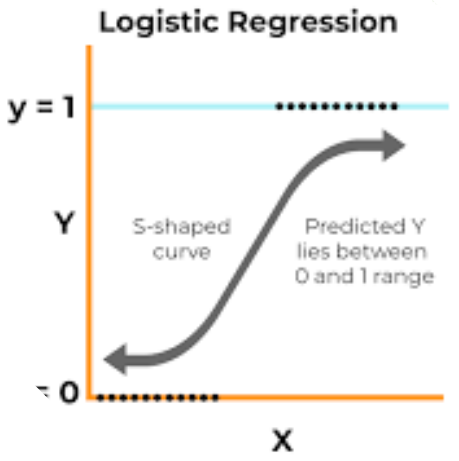
It does so by considering a set of independent (features) variables, evaluating the various factors that might determine one's employment status.

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

By understanding the key factors impacting employment status, we can design policies, programs, and initiatives tailored to the unique needs of individuals seeking employment in the country.

Logistic Regression Model





Feature	Coefficient	Percent Equivalent
PUFC05_AGE	0.0371	3.71%
PUFURB2015	-0.1206	-12.06%
PUFC04_SEX	0.0250	2.50%
PUFC09_GRADTECH	-0.1114	-11.14%
PUFC09A_NFORMAL	-0.0084	-0.84%
PUFC06_MSTAT_Annulled	0.0005	0.05%
PUFC06_MSTAT_Divorce/Separate	-0.0224	-2.24%
PUFC06_MSTAT_Married	0.2534	25.34%
PUFC06_MSTAT_Single	-0.2467	-24.67%
PUFC06_MSTAT_Unknown	0.0009	0.09%
PUFC06_MSTAT_Widowed	0.0143	1.43%
PUFC07_GRADE_GRADUATE	-0.0870	-8.70%
PUFC07_GRADE_NO GRADE COMPLETED	-0.0029	-0.29%
PUFC07_GRADE_UNDERGRADUATE	0.0899	8.99%

Discussion:

The above features and coefficients represent the various factors that can affect the likelihood of unemployment. However, the findings suggesting that having a technical course, informal training, graduate degree and living in the city make you less likely to be employed may raise questions.

This means, it's crucial to consider the dataset and the variables in play. Further analysis and investigation are needed for a deeper understanding of these observations.

Logistic Regression (Coefficient Interpretation)

AGE:
For each year you get older, there's a 3.71% higher chance of being employed.

URBAN LIVING {Rural:0, Urban:1}:
If you live in the city, you have a 12.06% lower chance of being employed compared to rural areas.

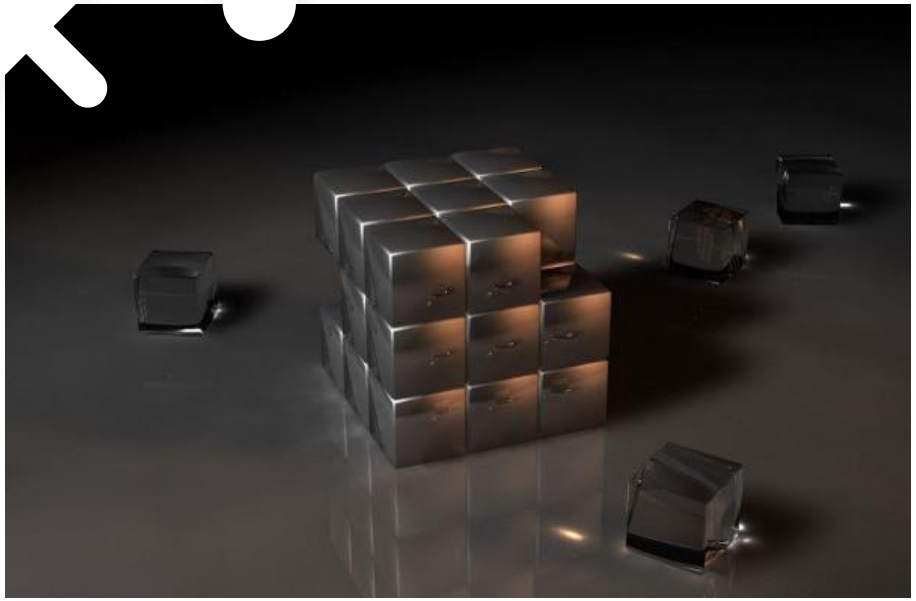
GENDER {Female:0, Male:1}:
Males have a 2.50% higher chance of being employed than females.

TECHNICAL EDUCATION {No:0, Yes:1}:
If you completed a technical course, you're 11.14% less likely to be employed.

INFORMAL TRAINING {No:0, Yes:1}:
Participating in informal training decreases your chances of being employed by about 0.84%.

EDUCATION:
- Having a graduate degree makes you 8.70% less likely to be employed.
- Not completing any grade level reduces your employment chance by 0.29%.
- Holding a bachelor's degree lowers your unemployment chance by 8.99%.

MARITAL STATUS:
- If your marriage was annulled, your chance of employment goes up by 0.05%.
- If you're divorced or separated, you're 2.24% less likely to be employed.
- Being married makes you 25.34% likely to be employed.
- If you're single, you have a 24.67% less likely to be employed.
- If your marital status is unknown, it has a tiny impact, increasing your employment chance by 0.09%.
- If you're widowed, your chance of being employed goes up by 1.43%.



Topic Six

What to Do Next

*** Part of:

- Conclusions and Recommendations

Portraying The Unemployment Landscape:

UNEMPLOYMENT RATE

Conclusion:

- ECONOMIC STABILITY PRE-2020:

The control chart analysis visually illustrates fluctuations in unemployment rates. The variations observed before year 2020 are likely attributed to common causes inherent in the process, such as economic cycles or seasonal employment changes.

- COVID-19 IMPACT:

The sharp increase in the 2020 unemployment rate was caused by the impact of COVID-19 on the global and local economy. This led to businesses closing down, people losing their jobs, and economic uncertainty. This unexpected event greatly disturbed the previously steady economic conditions.

Recommendation:

Given the abrupt spike in the 2020 unemployment rate beyond the established limits, it is crucial to implement proactive measures for economic resilience.

This includes developing contingency plans and policies that address the impact of unforeseen events, such as global crises or pandemics.

Additionally, continuous monitoring and analysis of economic indicators can aid in early detection of potential issues, allowing for timely intervention and mitigation strategies.

By enhancing preparedness and adaptability, the economy can better withstand external shocks and maintain stability in the face of uncertainties.

Portraying The Unemployment Landscape:

UNEMPLOYED OCCUPATIONS

Conclusion:

- TARGETED INTERVENTIONS:

After analyzing the Pareto chart, it's clear that the key players in the unemployment problem are the jobs in "Elementary Occupations" and "Service and Sales Workers." Together, they make up a whopping 75% of all the unemployment cases.

In simple terms, most of the people without jobs are either in "Elementary Occupations" or "Service and Sales Workers." Other jobs on the list contribute less to the overall

- MINOR CONTRIBUTIONS:

Even though other listed occupations are small in value, they still have some relative impact overall.

Recommendation:

Based on the Pareto Chart Analysis, the major culprits behind unemployment are "Elementary Occupations" and "Service and Sales Workers," making up a whopping 75% of the total unemployment rate.

To address this, we can tailor our plans for each job type and focus on the most significant contributors to effectively combat unemployment.

Also, understanding the unique challenges each job faces is crucial which allows us to create tailored rules and plans that cater to their specific needs.

These approaches aim to build a well-rounded job market that can handle challenges more effectively, ultimately reducing overall unemployment.

Diagnosing Employment Discrepancies:

FACTORS IMPACTING EMPLOYMENT

Conclusion:

- CRUCIAL FACTORS REVEALED BY CHI-SQUARE TEST:

Significance is gauged through p-values, where smaller values indicate greater influence on job prospects.

This means that the influential factors act as keys shaping job opportunities and vary based on our background related to them; such as follows:

- Different regions have varying economic activity, industries, and job opportunities, leading to diverse employment outcomes.
- Higher education levels may result in better skills and qualifications, enhancing employability.
- Individuals with technical or vocational training exhibit distinct employment patterns.

Recommendation:

For better job opportunities, policymakers need to focus on improving underdeveloped regions by increasing economic activity, creating new industries, and generating jobs.

On the other hand, educators also has a key role in this by ensuring students receive quality education and training that equips them with the skills needed for the job market.

In regards with technical and vocational education programs, investment is crucial as completing these courses significantly impacts employment status.

This way, people can gain the skills and knowledge necessary for success in the job market.

Diagnosing Employment Discrepancies:

AGE & JOB SEARCH TREND

Conclusion:

- SIGNIFICANT FINDINGS:

The ANOVA analysis yielded compelling results, with a remarkably small p-value (8.86E-20) suggesting a non-random disparity in how distinct age groups approach job searching, leading to the rejection of the "NULL" hypothesis.

Essentially, this confirms that different age groups employ unique and distinct job hunting methods.

- VALUABLE FOUNDATION:

The understanding from ANOVA analysis provides a solid foundation for the development of targeted programs and services aimed at assisting job seekers across all age groups.

Recommendation:

As revealed by the ANOVA analysis, people in various categories has a unique job search behaviors and approach.

This means, it's crucial to design targeted programs that cater to their specific needs such as:

- Younger job seekers might focus on online job platforms.
- Older job seekers could emphasize networking and traditional job search methods.

This tailored approach ensures that support programs resonate with the distinct job hunting behaviors exhibited by individuals of different age groups, ultimately enhancing the effectiveness of assistance initiatives.

PREDICTING EMPLOYMENT STATUS

Conclusion:

- SIGNIFICANT FINDINGS:

The logistic regression analysis revealed that age, urban living, gender, technical education, informal training, and education level are significant factors that impact employment status. Marital status was also found to be a significant factor, with being married decreasing the likelihood of unemployment while being single increases it.

- VALUABLE FOUNDATION:

The analysis provides valuable insights into the factors that impact employment status and can be used to design targeted policies, programs, and initiatives to assist job seekers.

Recommendation:

Policymakers and stakeholders can develop targeted programs and services to help job seekers of different ages, genders, and educational backgrounds such as:

- Tailored job placement programs for different age groups can help individuals find suitable employment opportunities more effectively.

Also, employers can create more inclusive hiring practices such as gender-inclusive employment policies. Address the 2.50% higher chance of employment for males by promoting gender equality and supporting industries where gender disparities exist.

Meanwhile, in-depth analysis and investigation should be conducted to validate and refine the observations from the dataset since having a technical course, informal training, graduate degree and living in the city make you less likely to be employed may raise questions.

Summary

In a nutshell, the data and insights we've gathered provide valuable guidance for the government and various organizations. We 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

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