CHAPTER 5 – DATA ANALYSIS II

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5.1 CHAPTER INTRODUCTION

In this chapter the researcher uses inferential statistics to analyze data. With inferential statistics, the researcher is trying to reach conclusions that extend beyond the immediate data alone, such as to try to infer from the sample data what the population might think. The researcher has used inferential statistics to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. A standard hypothesis testing procedure was used, which has been described in the following figure.

Figure 5.1 – Hypothesis Testing Process
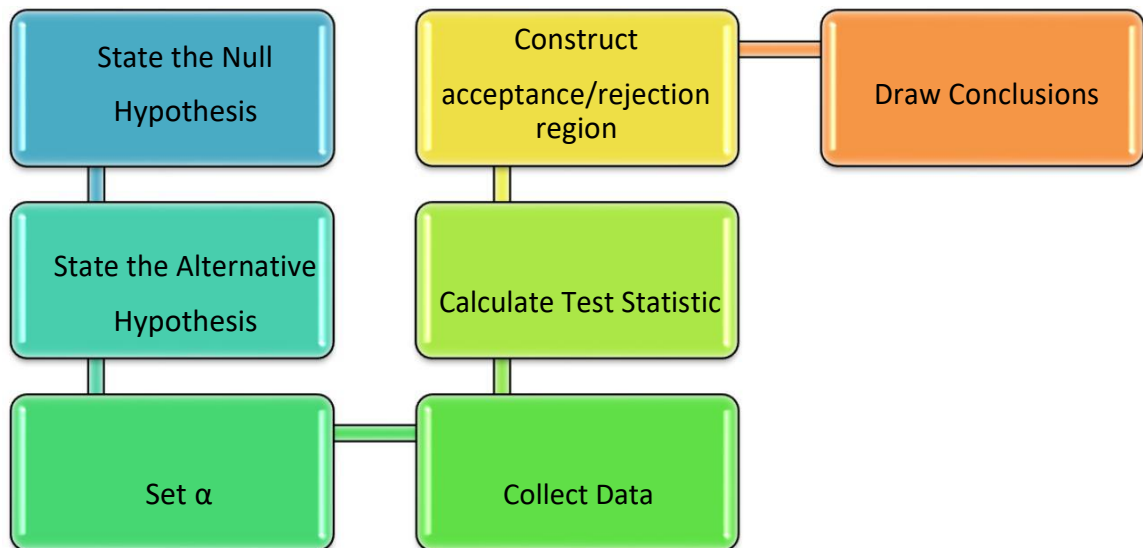
The process of hypothesis testing begins with specifying the null hypothesis. For a two-tailed test, the null hypothesis is typically that a parameter equals zero although there are exceptions. A typical null hypothesis is $\mu1 - \mu2 = 0$ which is equivalent to $\mu1 = \mu2$. For a one-tailed test, the null hypothesis is either that a parameter is greater than or equal to zero or that a parameter is less than or equal to zero. If the prediction is that $\mu1$ is larger than $\mu2$, then the null hypothesis (the reverse of the prediction) is $\mu2 - \mu1 \geq 0$. This is equivalent to $\mu1 \leq \mu2$.

Subsequently the researcher specifies α level which is also known as the significance level.

Typical values are 0.05 and 0.01. This is followed by the next step which is to compute the probability value (also known as the p value). This is the probability of obtaining a sample statistic as different or more different from the parameter specified in the null hypothesis given that the null hypothesis is true.

Finally, the researcher compares the probability value with the α level. If the probability value is lower than the case is for rejecting the null hypothesis. Keep in mind that rejecting the null hypothesis is not an all-or-none decision. The lower the probability value, the more confidence one can have that the null hypothesis is false. However, if probability value is higher than the conventional α level of 0.05, the case is for accepting null hypothesis.

5.2 INFERENTIAL DATA ANALYSIS

The hypotheses tested by the researcher are enumerated below -

Hypotheses

Hypothesis 1:
- H1: Usage of HRIS Practices is marginally correlated with type of organization, Size of organization and available HRIS modules.

Further divided in to three sub hypothesis as:

- H1.1: HRIS usage is significantly related with organization size.
- H1.2: Organizations are not using all the modules of HRIS implemented.
- H1.3: HRIS usage depends on type of Organization.

Hypothesis 2:

- H2: The impact of HRIS is significant on performance in organizations in terms Cost, time and Decision making.

Further divided in 3 sub hypothesis –

- H2.1: HRIS has significant impact on decrease in process cost.
- H2.2: HRIS has significant impact on decrease in process time.
- H2.3: HRIS has significant impact on effective decision making.

Hypothesis No.3

- H3: HRIS has significant impact on processes improvement concern with type of organization.
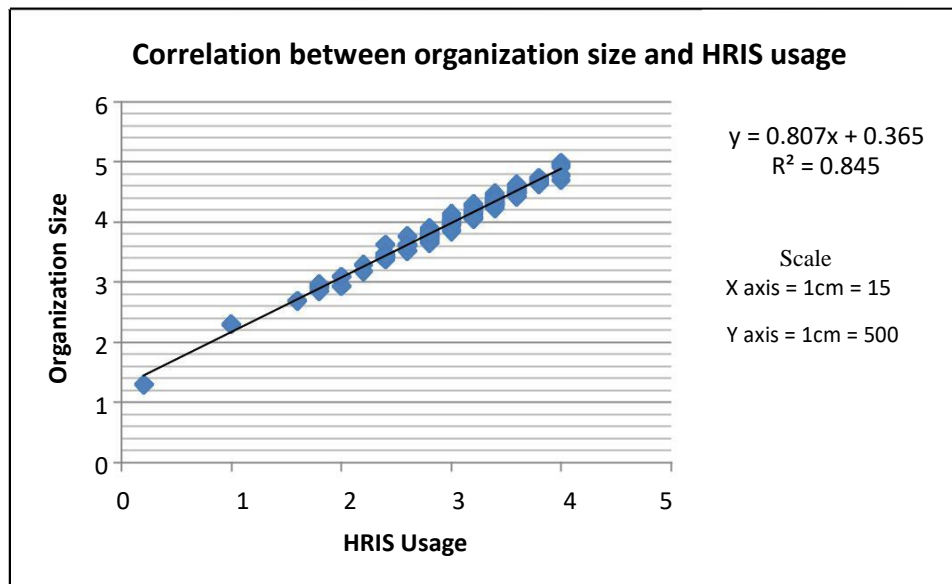
Hypothesis No.4

- H4: HRIS users are acquainted with technical details of HRIS system.

In the subsequent discussion the researcher lays down the outcomes of hypotheses testing. Each of the above stated hypotheses has been tested using an appropriate test, the details of which have been described in this compendium in the Research Methodology chapter.

H1: Usage of HRIS Practices is marginally correlated with type of organization, Size of organization and available HRIS modules.

Hypothesis 1.1 - HRIS usage is significantly related with organization size

The researcher used correlation coefficient to study the relationship between organization size and HRIS usage. The findings are presented in the following scatter plot.

The trend line in the above figure exhibit a positive correlation between organization size and HRIS usage. Correlation coefficient is 0.845 and the linear regression equation is $y = 0.807x + 0.365$.

Hypothesis 1.2 - Organizations are not using all modules of HRIS implement

H0 – There is no statistical difference between the groups of organizations.

H1 – There is a statistical difference between the groups of organizations.

Kruskal-Wallis H test was used to test the hypothesis and the results are displayed in the table below.

		Mean score	KW-Test	p-value
Impact on Performance	Group 1	3.51	3.71	0.1712
	Group 2	3.63		
	Group 3	3.37		

The analysis of the above table show that the null hypothesis H0 assumed above was accepted which stated that no significant difference was recorded among the average overall response pattern of the respondent companies categorized according to organization size, namely –
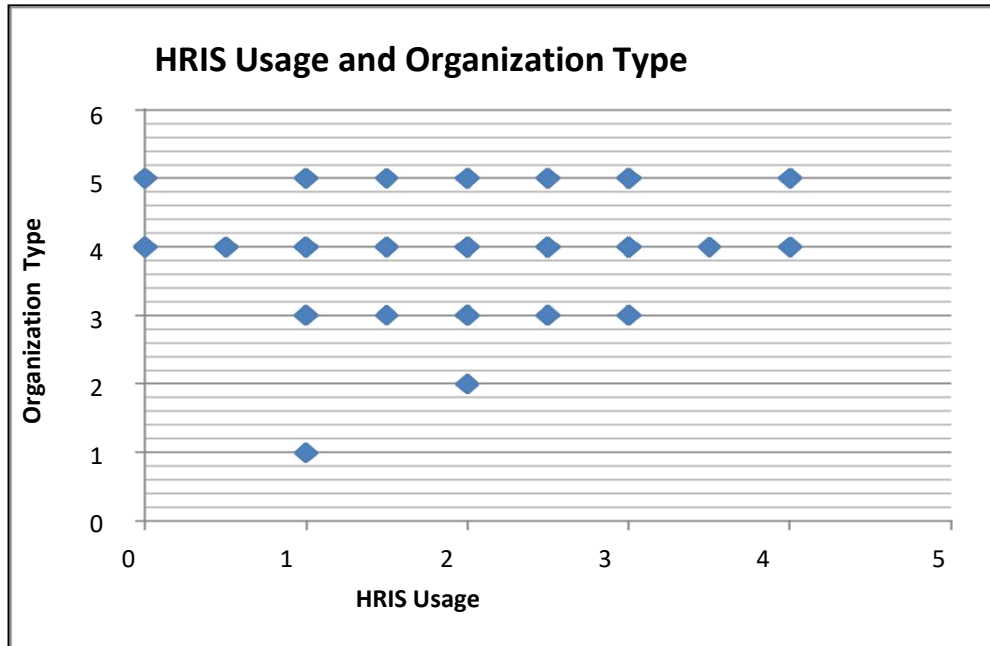
Group 1 - Less than 300 Employees

Group 2 - 300 and more but less than 2,000 Employees

Group 3 - 2,000 and more Employees

The mean score for respondents from Group 1 organizations was 3.51, Group 2 was 3.63 and Group 3 was 3.37 respectively. The test results, hence, imply that organizations are not using all modules of HRIS implemented.

Hypothesis 1.3 - HRIS usage depends on Type of Organization

The researcher used correlation coefficient to study the relationship between Type of Organization and HRIS usage. The findings are presented in the following scatter plot.

HRIS Usage and Organization Type

(scatter plot with x-axis labeled "HRIS Usage" ranging 0 to 5, and y-axis labeled "Organization Type" ranging 0 to 6)

The scatter plot in the above figure exhibits no association between HRIS Usage and Organization Type. The researcher can conclude that HRIS usage does not depend on organization type.

H2: The impact of HRIS is significant on performance in organizations in terms Cost, time and Decision making.

Hypothesis 2.1 - HRIS has positive impact on decrease in process cost

H0 – There is no statistical difference between the groups of organizations – using HRIS for less than five years and those using HRIS for five and more than five years.

H1 – There is a statistical difference between the groups of organizations – using HRIS for less than five years and those using HRIS for five and more than five years.

The researcher attempted to find out whether HRIS has a positive impact on decrease in process cost. Process cost has been indicated by cost per hire, recruiting expenses, training expenses, and overall HR staff salary expense. The researcher calculated a mean score of employee responses for the components of process cost to arrive at a Process Cost Indicator. Subsequently, the researcher used Mann-Whitney U Test to test the hypothesis, i.e., whether there is a significant difference between the respondent groups – organizations using HRIS for less than five years and organizations using HRIS for five or more than five years. The test results are presented in the following table.

Mann-Whitney U Test Statistics [a]	
	Process Cost Indicator
Mann-Whitney U	7146.0
Wilcoxon W	11324.0
Z	-0.124
Asymp. Sig. (2-tailed)	0.514
a. Grouping Variable: Years of HRIS use	

The above table designates p value = 0.514 which is greater than 0.05. This indicates that the data gives reason to accept null hypothesis and enables the interpretation that there is no statistical difference between the respondent groups. It leads the research to believe that HRIS has a positive impact on decrease in process cost.

Hypothesis 2.2 - HRIS has positive impact on decrease in process time

H0 – There is no statistical difference between the groups of organizations – using HRIS for less than five years and those using HRIS for five and more than five years.

H1 – There is a statistical difference between the groups of organizations – using HRIS for less than five years and those using HRIS for five and more than five years.

The researcher attempted to find out whether HRIS has a positive impact on decrease in process time. Process time has been measured by the researcher in terms of the time spent on recruitment, training, making staff decisions, communicating organization-wide information, processing paperwork, and correcting errors. The researcher calculated a mean score of employee responses for the components of process time to arrive at a Process Time Indicator.

Subsequently, the researcher used Mann-Whitney U Test to test the hypothesis, i.e., whether there is a significant difference between the respondent groups – organizations using HRIS for less than five years and organizations using HRIS for five or more than five years. The test results are presented in the following table.

Mann-Whitney U Test Statistics [a]	
	Process Time Indicator
Mann-Whitney U	9211.0
Wilcoxon W	14213.0
Z	-0.159
Asymp. Sig. (2-tailed)	0.721
a. Grouping Variable: Years of HRIS use	

The above table designates p value = 0.721 which is greater than 0.05. This indicates that the data gives reason to accept null hypothesis and enables the interpretation that there is no statistical difference between the respondent groups. It leads the research to believe that HRIS has a positive impact on decrease in process time.

<u>Hypothesis 2.3 - HRIS has positive impact on effective decision making</u>

H0 – There is no statistical difference between the groups of organizations – using HRIS for less than five years and those using HRIS for five and more than five years

H1 – There is a statistical difference between the groups of organizations – using HRIS for less than five years and those using HRIS for five and more than five years.

The researcher attempted to find out whether HRIS has a positive impact on effective decision-making, by using Mann-Whitney U Test to test the hypothesis, i.e., whether there is a significant difference between the respondent groups – organizations using HRIS for less than five years and organizations using HRIS for five or more than five years. The test results are presented in the following table.

Mann-Whitney U Test Statistics [a]	
	Decision-making
Mann-Whitney U	7513.0
Wilcoxon W	12216.0
Z	-0.131
Asymp. Sig. (2-tailed)	0.425
a. Grouping Variable: Years of HRIS use	

The above table designates p value = 0.425 which is greater than 0.05. This indicates that the data gives reason to accept null hypothesis and enables the interpretation that there is no statistical difference between the respondent groups. It leads the research to believe that HRIS has a positive impact on effective decision-making.

Hypothesis 3 - HRIS has significant impact on processes improvement concern with type of organization.

The researcher used correlation coefficient to study the relationship between Type of Organization and Improvement to process. The findings are presented in the following scatter plot.
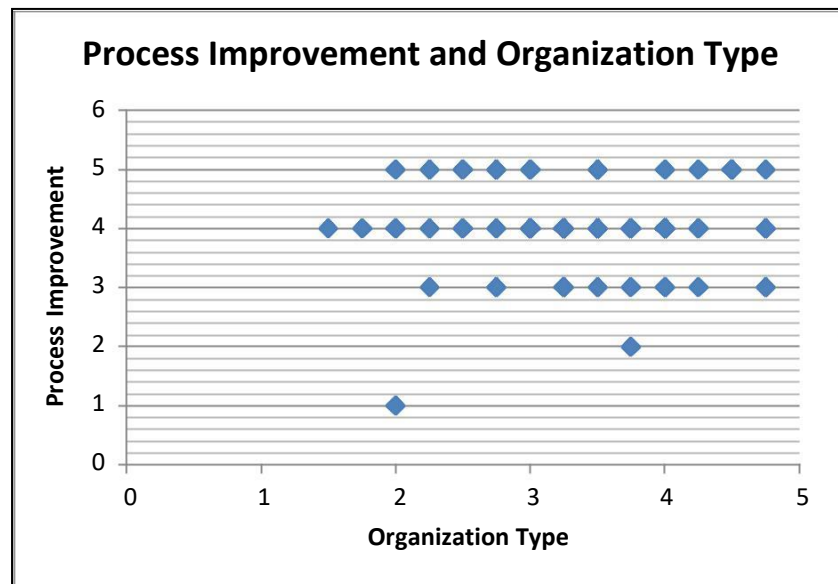
The scatter plot in the above figure exhibits no association between Process Improvement and Organization Type. The researcher can conclude that Improvement to processes does not depend on organization type.

Hypothesis 4- HRIS users are acquainted with technical details of HRIS system.

H0 – There is no statistical difference between the groups of organizations – using HRIS for less than five years and those using HRIS for five and more than five years.

H1 – There is a statistical difference between the groups of organizations – using HRIS for less than five years and those using HRIS for five and more than five years.

The researcher attempted to find out whether HRIS users know the technical details of HRIS system and used Mann-Whitney U Test to test the hypothesis, i.e., whether there is a significant difference between the respondent groups – organizations using HRIS for less than five years and organizations using HRIS for five or more than five years. The test results are presented in the following table.

Mann-Whitney U Test Statistics [a]	
	Technical Details
Mann-Whitney U	7125.0
Wilcoxon W	13267.0
Z	-2.647
Asymp. Sig. (2-tailed)	0.027
a. Grouping Variable: Years of HRIS use	

The above table designates p value = 0.027 which is less than 0.05. This indicates that the data gives reason to reject null hypothesis and enables the interpretation that there is a statistical difference between the respondent groups. It leads the researcher to believe HRIS users do not know the technical details of HRIS system.

5.3 Chapter Conclusion

In this chapter the researcher used inferential statistical analysis to test hypothesis. The researcher's empirical analysis reveals that -

There is a positive correlation between organization size and HRIS usage

Organizations are not using all modules of HRIS implemented

HRIS usage does not depend on organization type.

Improvement to processes does not depend on organization type.

HRIS users do not know the technical details of HRIS system.

HRIS has positive impact on processes improvement

HRIS has positive impact on decrease in process cost

HRIS has positive impact on decrease in process time

HRIS has positive impact on effective decision making

In the next chapter the researcher summarizes and concludes the findings of the research. The researcher further aspires to make suggestions and open doors to future research on the subject based on the rich experience acquired during the current research exercise.