CHAPTER 5

HYPOTHESIS TESTING
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5.1 INTRODUCTION

“People are ‘erroneously confident’ in their knowledge and underestimate the odds that their information or beliefs will be proved wrong. They tend to seek additional information in ways that confirm what they already believe” Max Bazerman, Harvard University

Hypotheses is a tentative Proposition to the possible answers to the research questions. Formulation of hypothesis is an important step since it is the principal instrument in research. The hypothesis is considered as a tentative answer because it’s genuineness can be evaluated only after it has been tested empirically.

The current research is done to understand the effectiveness of implementing RFID in various applications, by studying the constituent functions in the institutes and checking whether the use of RFID would be helpful to increase the effectiveness of the institute.

Through questionnaires as well as through interview, the working of all the MCA institutes was studied which involved total 372 respondents.

5.2 TESTING OF HYPOTHESIS

The main objective was to find out whether there is any association between RFID implementation and it’s effectiveness in the day to day working of the professional Institute. The hypothesis was formulated as under:
“The working effectiveness of the professional institute is correlated with implementation of RFID”

The day to day working in these institutes involves various functions, so to test and validate the hypothesis, following 6 constituent functions were identified by the researcher.

a. Staff attendance  
b. Students attendance  
c. Report generation  
d. Monitoring Guard patrolling  
e. Asset checking  
f. Library

To find the association of RFID implementation and working effectiveness of the institute, the above mentioned constituent functions were taken into consideration and the six components for the hypothesis were formulated.

This hypothesis was statistically stated as

\[ \text{H0: “The working effectiveness of the professional institute is not correlated with implementation of RFID ”} \]

\[ \text{Ha: “The working effectiveness of the professional institute is correlated with implementation of RFID ”} \]

To validate the hypothesis, the variables were identified from the questions from the respondents’ questionnaire corresponding to the
above constituent functions. These identified variables are discrete categorical variables measured on ordinal scale, so **spearman’s Rank correlation coefficient (Rho)** was thought to be the most appropriate test.

The components for the hypothesis are as follows:

**5.2.a. “The working effectiveness of the professional institute is correlated with maintaining staff attendance using RFID.”**

To validate the above component of the hypothesis, two variables v1 & v2 were identified. The variable v1 was identified from the questions from the questionnaire which asked the various respondents about use of RFID in staff attendance as follows: Director - Q.23, Teaching Staff - Q25, Office in Charge Q28, System Administrator - Q.24, Librarian - Q25.

Second variable v2 was identified from the following questions from the respondents’ questionnaire Director - Q.6, Teaching staff - Q.14, Librarian - Q.18, System Administrator Q.10, Office in Charge (Q.15).

The component of the hypothesis can be statistically stated as

**H0: “The working effectiveness of the professional institute (v1) is not correlated with maintaining staff attendance using RFID (v2).”**

**H1: “The working effectiveness of the professional institute (v1) is correlated with maintaining staff attendance using RFID (v2).”**

**Test statistic :** Spearman’s Rank Correlation coefficient.

**Observation :** Spearman’s Rank correlation coefficient (Rho) = 0.301
Inference : As rho is positive and p<0.05, there is a positive correlation between v1 and v2

5.2.b. “The working effectiveness of the professional institute is correlated with maintaining Students’ attendance using RFID.”

To validate the above component of the hypothesis, two variables v1 and v3 were identified. The first variable v1 is identified as given in the section 5.2.a and second variable v3 is identified from the following questions from questionnaire which asked the various respondents about use of RFID in student’s attendance: Director - Q.7, Teaching Staff - Q.19, Office in Charge - Q.18, System Administrator - Q.13, Librarian - Q.2

The component of the hypothesis can be statistically stated as:

**H0**: “The working effectiveness of the professional institute (v1) is not correlated with maintaining students’ attendance using RFID (v3).”

**H2**: “The working effectiveness of the professional institute (v1) is correlated with maintaining students’ attendance using RFID (v3).”

**Test statistic** : Spearman’s Rank Correlation coefficient.

**Observation** : Spearman’s Rank correlation coefficient (Rho ) = 0.323 with p = 0.001, n = 372

**Inference** : As rho is positive and p < 0.05, there is a positive correlation between v1 and v3
5.2.c. “The working effectiveness of the professional institute is correlated with report generation using RFID”

To validate the above component of the hypothesis, two variables v1 and v4 were identified. The first variable v1 is identified as given in the section 5.2.a and second variable v4 is identified from the following questions from questionnaire which asked the various respondents about use of RFID in various report generation: Director - Q.19, Teaching staff - Q12.

This component of the hypothesis was statistically stated as:

**H0**: “The working effectiveness of the professional institute (v1) is not correlated with report generation using RFID (v4)”

**H3**: “The working effectiveness of the professional institute (v1) is correlated with report generation using RFID (v4)”

**Test statistic**: Spearman’s Rank Correlation coefficient.

**Observation**: Spearman’s Rank correlation coefficient (Rho ) = 0.412 with p = 0.001 and n = 314

**Inference**: As rho is positive and p < 0.05, there is a positive correlation between v1 and v4

5.2.d “The working effectiveness of the professional institute is correlated with monitoring the guard patrolling using RFID”

To validate the above component of the hypothesis, two variables v1 and v5 were identified. The first variable v1 is identified as given in the section 5.2.a and second variable v5 is identified from the following
questions from the questionnaire which asked the various respondents about use of RFID in monitoring the guard patrolling in the Institute: Director - Q.14, Teaching Staff - Q.23, Office in Charge - Q.27, System Administrator - Q.19, Librarian - Q.23

This component of the hypothesis was statistically stated as

H0: “The working effectiveness of the professional institute (v1) is not correlated with monitoring of guard patrolling using RFID (v5).”

H4: “The working effectiveness of the professional institute (v1) is correlated with monitoring of guard patrolling using RFID (v5).”

Test statistic: Spearman’s Rank Correlation coefficient.

Observation: Spearman’s Rank correlation coefficient (Rho ) = 0.361 with p = 0.001 and n= 372

Inference: As rho is positive and p < 0.05, there is a positive correlation between v1 and v5

5.2.e “The working effectiveness of the professional institute is correlated with asset checking using RFID”

To validate the above component of the hypothesis, two variables v1 and v6 were identified. The first variable v1 is identified as given in the section 5.2.a and second variable v6 is identified from the following questions from questionnaire which asked the various respondents about use of RFID in asset checking: Director - Q.10, Office-in-Charge - Q.22, System Administrator - Q.18.

This component of the hypothesis was statistically stated as
H0: “The working effectiveness of the professional institute (v1) is not correlated with asset checking using RFID (v6).”

H5: “The working effectiveness of the professional institute (v1) is correlated with asset checking using RFID (v6).”

Test statistic : Spearman’s Rank Correlation coefficient.

Observation : Spearman’s Rank correlation coefficient (Rho) = 0.688 with p = 0.001 and n= 58

Inference : As rho is positive and p < 0.05, there is a positive correlation between v1 and v6

5.2.f “The working effectiveness of the professional institute is correlated with implementation of RFID in Library”

To validate the above component of the hypothesis, two variables v1 and v7 were identified. The first variable v1 is identified as given in the section 5.2.a and second variable v7 is identified from the following questions from questionnaire which asked the various respondents about use of RFID in library: Director - Q.18, Teaching Staff - Q.24, System Administrator - Q.20, Librarian - Q.24.

This component of the hypothesis was statistically stated as

H0: “The working effectiveness of the professional institute (v1) is not correlated with implementation of RFID in library (v7).”

H6: “The working effectiveness of the professional institute (v1) is correlated with implementation of RFID in library (v7).”

Test statistic : Spearman’s Rank Correlation coefficient.
**Observation**: Spearman’s Rank correlation coefficient (Rho) = 0.204 with p = 0.001 and n= 354

**Inference**: As rho is positive and p < 0.05, there is a positive correlation between v1 and v7

From the above components of the hypotheses, stated and tested in sections 5.2.a to 5.2.f. The effectiveness of the professional Institute is positively correlated to the RFID implementation in staff attendance, students’ attendance, Report generation, Asset checking, Monitoring Guard patrolling and Library.

**Inference**: The hypothesis, “The working effectiveness of the professional institute is correlated with implementation of RFID” is thus tested and validated.

**Conclusion**: While validating and testing of the hypotheses, it has been observed that Spearman’s Rank correlation coefficient (Rho) with p = 0.001 for all the 7 variables is positive. Using this statistic it can be concluded that there is a positive correlation between the implementation of RFID and the working effectiveness of the institute. Since all the constituent functions identified namely: Staff attendance, Students’ attendance, Report generation, Monitoring of guard patrolling, Asset checking and Library, show a positive value of correlation coefficient, it is further concluded that the implementation of RFID in these identified functions would increase the working effectiveness of the professional Institute.

It is also seen that the variable representing Asset checking has value of Spearman’s Rank Correlation Coefficient (Rho) greater than 0.5 which shows RFID implementation in this functional area has a strong
correlation with the institute’s working effectiveness, but the remaining 5 functions have Rho less than 0.5, showing a weak correlation. The respondents are agreeing that there is a positive correlation but still with some uncertainty. On the basis of observation & the study done, the researcher feels that there is a need of educating the stakeholders since once the implementation is done at least in one of the functional areas, the effectiveness would be clearly understood.

REFERENCES