

# Quantitative methods and analysis

Business, Management



1. Problem A faster loan processing time increases the productivity of a bank and also leads to greater satisfaction. Let us take the example of a bank in which the bank manager wants to calculate the average loan processing time and establish a baseline for the same. Also his main purpose is to compare this average processing time with that of a competitor famous for quick loan processing. According to market information collected by his staff, the competitor claims its average processing time to be 6 hours (One-sample T-test, 2007).

## 2. Methodology for testing

The financial analyst in the bank makes note of the processing times for 16 applications in the past month on a random basis. The mean and standard deviation for this sample are calculated and compared with the competitor using t-test.

#

Loan Processing Time

1

4

2

5

3

6

4

7

5

8

6

2

7

10

8

4

9

3

10

4

11

5

12

7

13

7

14

12

15

3

16

4

Mean

5.6875

Standard Deviation

## 2. 701080031

### 3. Dependent and Independent variables

In this t-test, customer satisfaction is the dependent variable and loan processing time is the independent variable.

### 4. Hypothesis formulation

Based on the available information, null and alternate hypothesis can be developed as follows:

Ho: The loan processing time of the bank is 6 hours (Null hypothesis)

Ha: The loan processing time of the bank is not equal to 6 hours (Alternate Hypothesis)

### 5. Formulation of Confidence Intervals

Let us use a 95% confidence interval i. e. 95% of the times the mean would lie within this interval. The confidence interval can be calculated as:

CI = Mean  $\pm$  t (at 5% alpha level and 15 degrees of freedom for right tailed test)\*Standard deviation/ $n^{.5}$

i. e. CI = 5. 6875  $\pm$  1. 753\*(2. 7011/16<sup>. 5</sup>)

i. e. CI = (4. 504, 6. 871)

### 6. Testing & Results

t statistic = (5. 6875 - 6)/ (2. 701/ (16) <sup>. 5</sup>)

i. e. t statistic = -. 0289

p-value for this t statistic value can be calculated at 95% confidence interval and degrees of freedom as 15 (16-1). It comes out as . 511 for a 1-tailed test which would be appropriate for this case.

Since p-value > . 05, the null hypothesis is accepted and it can be said that there is not a significant difference between the loan processing time of the

bank from its competitor.

## 7. References

One Sample T-Test. (2007). Statistical Interference and T-tests. Minitab Inc.  
retrieved October 19, 2011 from