CALIFORNIA STATE UNIVERSITY
FULLERTON
MIHAYLO COLLEGE
OF BUSINESS AND ECONOMICS

ISDS 415

Decision Support & Business Intelligence Systems

PLE Case Study 2

By

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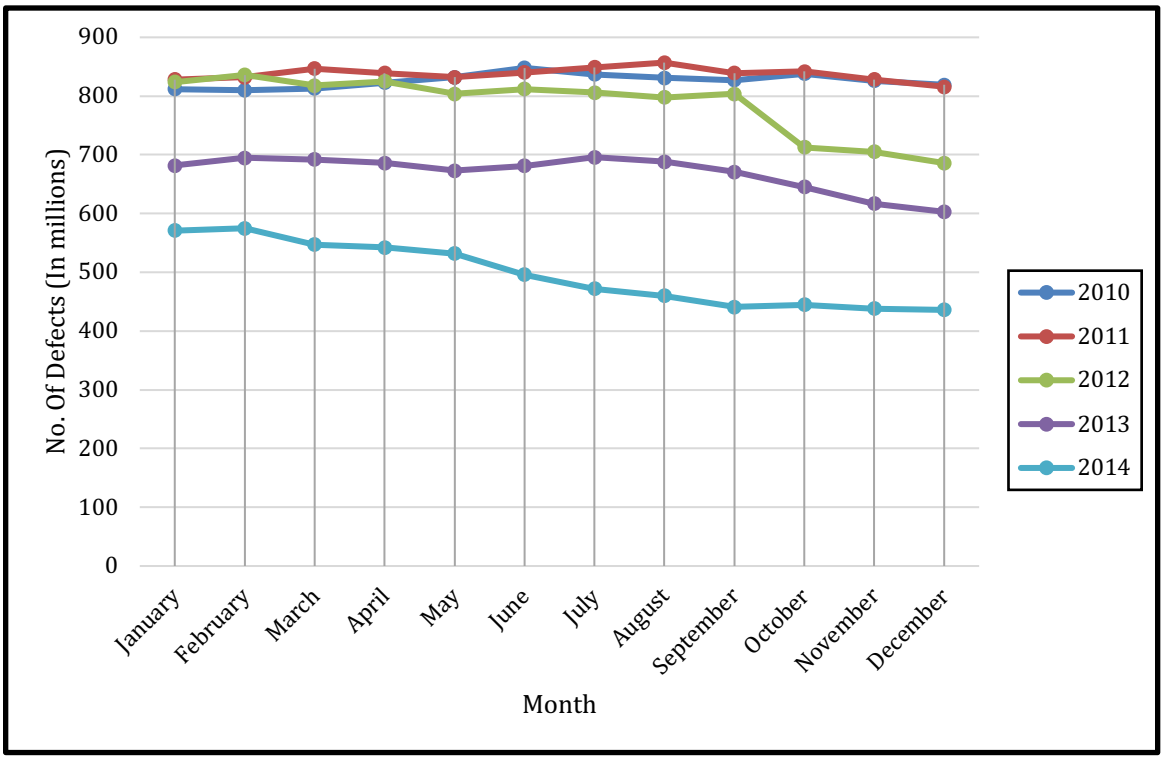
Questions

1. What might have happened had the supplier initiative not been implemented?

Ans: By not implementing the supplier initiative the number of defects would have increased which would affect the quality of the final product. Lower quality would lead to customer dissatisfaction thereby affecting the sales and leading to loss by the company. To enhance the quality and decrease the no. of defects, PLE should interact more with suppliers by installing a software which would lead to exchanging data electronically. This will not only help the suppliers to reduce the defects but also PLE to assist the suppliers better.

2. How the number of defects might further be reduced in the near future?

Ans:



The defects have decreased since 2010 and it can be seen that as of 2014 the decrease has been around 50% approximately. The number of defects is still high even though there has been a 50% decrease and to further reduce the overall defects PLE can work on maintaining its relations with supplier. The company can also focus on the reasons, for these defects to occur, through data analyses as well as by sharing the

data with supplier. In addition to this, PLE could encourage customer feedback to be informed about the defects simultaneously.

3. Determine the influence of the years of education, college grade point average, and age when hired have on how long each individual stayed with the company (retention).

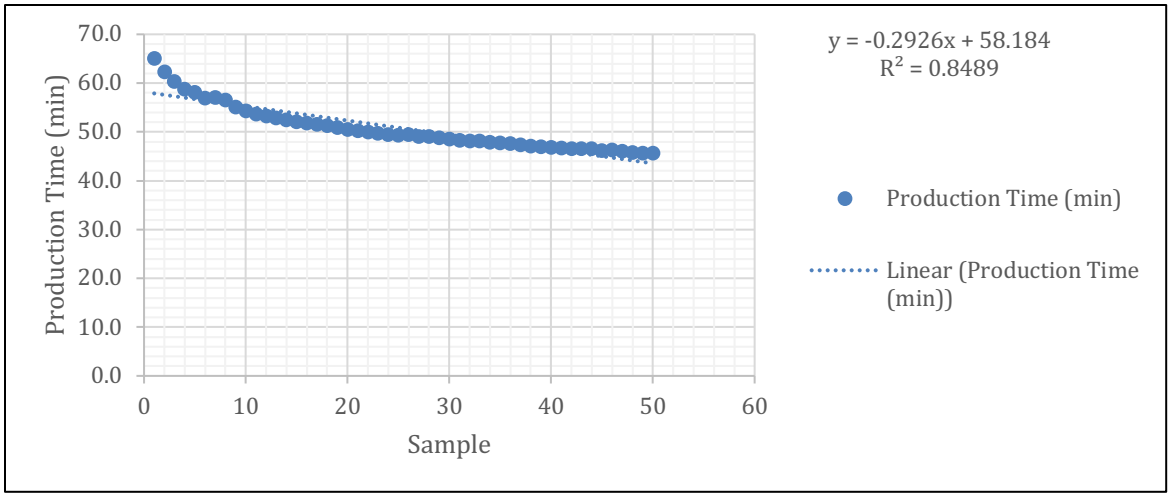
Ans: After running regression we can see that the P-values are as follows:

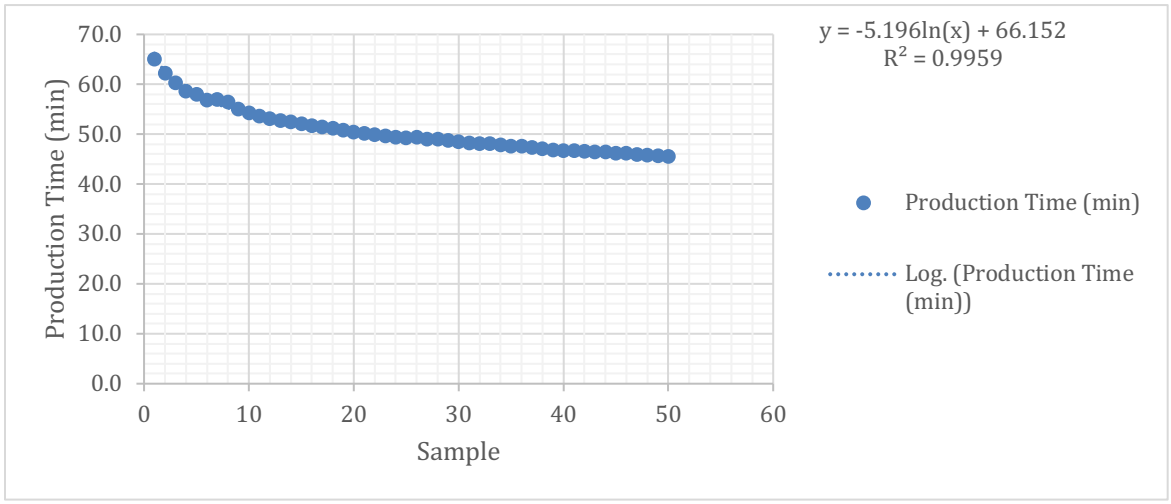
	Coefficients	*Standard Error*	*t Stat*	***P-value***
Intercept	-2.73710846	4.504149393	-0.607685985	**0.547210322**
YrsEducation	-0.067054294	0.355164691	-0.188797748	**0.851311676**
College GPA	0.679981319	1.183551377	0.574526237	**0.569184814**
Age	0.291535813	0.135043927	2.158822092	**0.037605843**

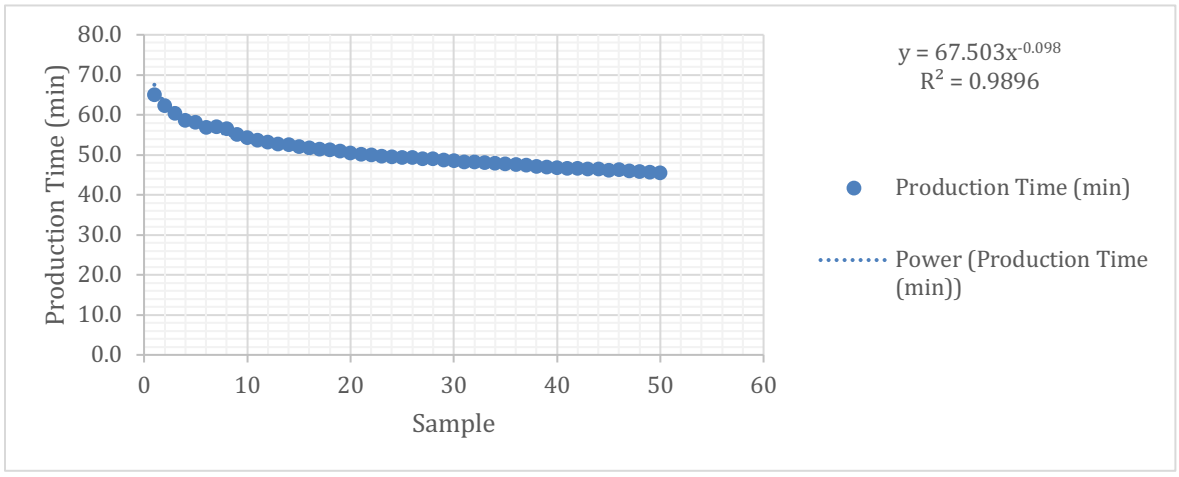
Since the p-value of age is less than 0.5, this factor would be sufficient to have an effect on retention. This means that for increase of age of newly hired employee each year, their retention will increase by 0.29 (Coeff. Of age).

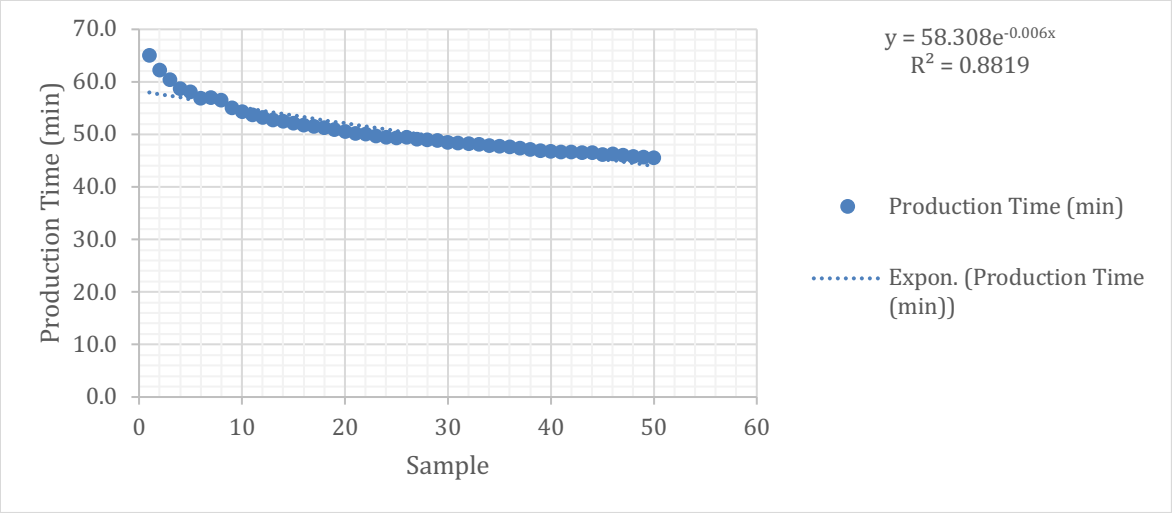
4. Because PLE is continually developing new technology, Elizabeth will like to be able to estimate future production costs using the rate of learning, without having to run extensive prototype trials.

Ans: To find the rate of learning we need to run several regressions with the help of trend line as follows:

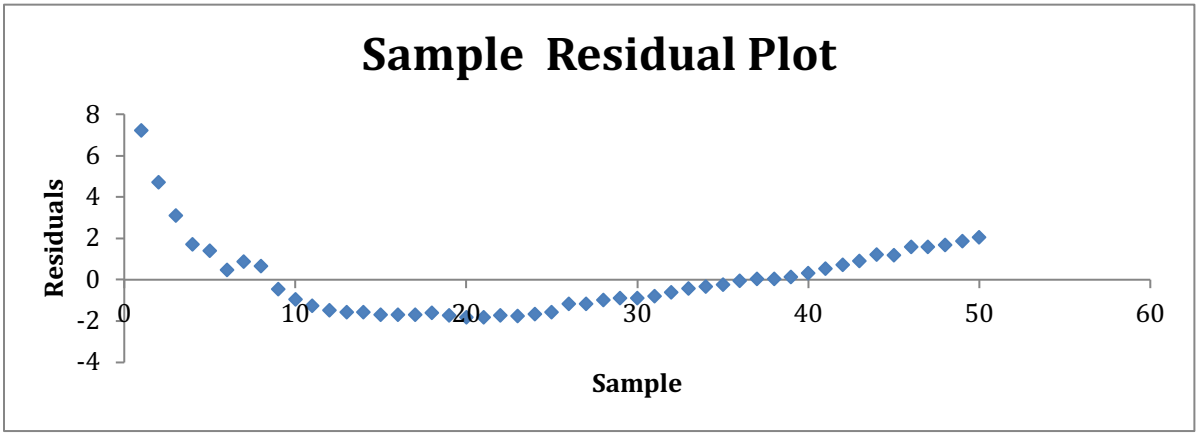

y = -0.2926x + 58.184
R² = 0.8489
Production Time (min)
Linear (Production Time (min))
Production Time (min)
Sample
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0
10
20
30
40
50
60


y = -5.196ln(x) + 66.152
R² = 0.9959
Production Time (min)
Log. (Production Time (min))
Production Time (min)
Sample
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0
10
20
30
40
50
60


y = 67.503x-0.098
R² = 0.9896
Production Time (min)
Power (Production Time (min))
Production Time (min)
Sample
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0
10
20
30
40
50
60



R^2 helps us to determine which model would be the best fit. From the above plots its very clear that Logarithmic regression would be the best model since it has the highest R^2.



From the Sample residual plot, it can be observed that there is variation in the regression line i.e. against homoscedasticity as well as the observations are related i.e. against independence.

This histogram helps us to check normality of errors and indicates that the model is not linear. Therefore, the rate of learning can be determined by this equation:
$y = -5.196\ln(x) + 66.152$ where for every unit the production time as well as production cost will decrease.