



Case Study

Travel Insurance Product Experiment & Business Model



Application of Statistical Experimentation & Regression Analysis to identify the statistically significant factors influencing customer satisfaction ratings and development of a Customer Satisfaction based Business Model Equation.

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The Scenario

You are an Insurance Provider.

Following initial analysis of your customers feedback and behaviour, you have identified an opportunity to provide flexible smart travel insurance aimed at travellers taking short business or leisure trips.

You see potential increase in revenue and website engagement using a smart Mobile App.

You develop several functional prototype website interfaces to get customer feedback including post-use surveys.

Question / Hypothesis

- A. What factors/variables should I include in a new smart travel insurance product?
- B. Which factors are driving up customer satisfaction?
- C. What daily premium are satisfied customers prepared to pay?

Methodology

With some statistical assistance, you identify the following factors to test in a statistical experiment. The experiment simply requires each factor to be set as two different levels.

Factor	Level 1	Level 2
A Number of days covered	3	28
B Cost per day (\$)	3	5
C Excess (\$)	0	500
D Claim Limit (\$000)	5	50
E Specified Items	No	Yes
F Mobile App	Yes	No
G 24/7 Tel Support	No	Yes

Experiment Trials

Traditionally, a test with 7 factors requires 128 trials, changing each factor one by one, to ensure the influence of each factor can be calculated accurately.

In practice, there is often insufficient time and resource to conduct 128 tests runs.

Statistical Experimentation reduces this to 16 runs by specifying key combinations of the factors and calculating the average effect for each factor at each level to provide an accurate estimate of each factor's influence.

For an internet based insurance product, 16 test runs is manageable.

For each run you ask a sample of customers to rate their Satisfaction with the Product out of 10; 1 being very dissatisfied, 10 being extremely Satisfied.

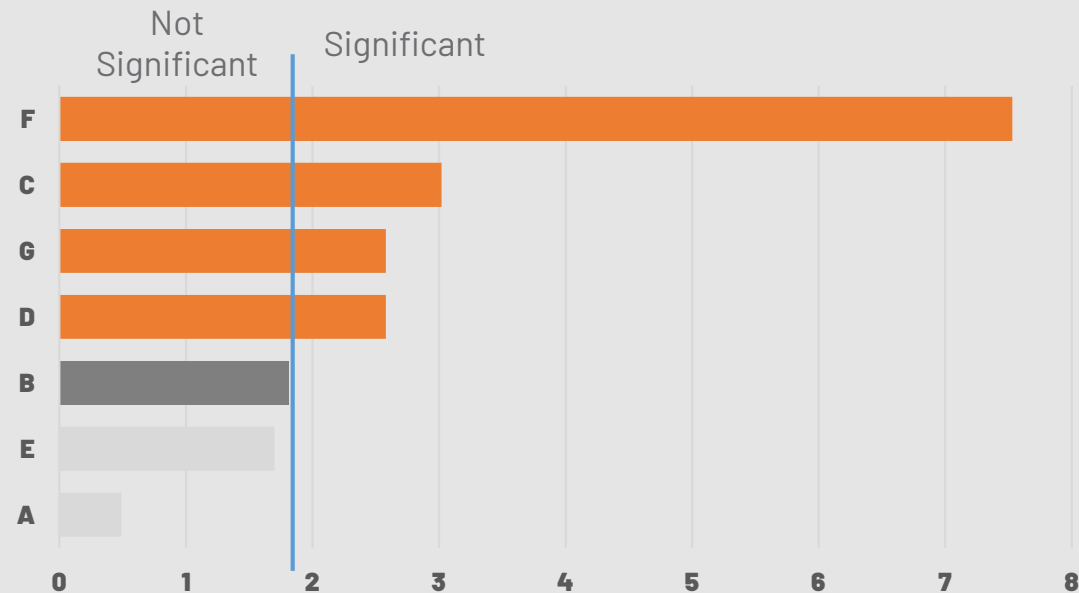
Significant Factors

The Effects Chart on the right plots the significance of each factor with 90% confidence.

By far the most significant factor is having a Mobile App (F).

Excess (C), the Claim Limit (G) having 24/7 Telephone Support (D) are also significant. Daily cost (B) is worth considering.

Not significant are the Number of Days (E) and Specifying Individual Items (A).



Standardised Effects are statistics that test that null hypothesis effect is 0. In other words, whether the alternative hypotheses are not zero.

Since the Standardised effect is shown to be 1.86, any factor that is larger is having a significant influence on the outcome.

Recommendation for Marketing

The Smart Travel Insurance product should focus on marketing and promoting the 5 most significant factors.

- Mobile App.
- Amount of Excess to pay.
- Claim Limit.
- Having 24/7 Telephone support.
- Daily Cost.

Business Model Equation

We have now identified the most significant factors driving customer Satisfaction. Since there were 16 tests, we can apply Regression Analysis to define the Satisfaction based Business Model Equation.

$$\begin{aligned}
 \text{Satisfaction Rating} &= 8.59 \\
 &- 0.413 \times \text{Daily Cost} \\
 &- 0.002750 \times \text{Excess} \\
 &+ 0.0261 \times \text{Claim Limit} \\
 &+ 0.0 \times \text{Mob App_Yes} - 3.425 \times \text{Mob App_No} \\
 &+ 0.0 \times \text{Tel Support_No} + 1.175 \times \text{Tel Support_Yes}
 \end{aligned}$$

Coefficients
-ve - lower is better
+ve - higher is better

Not having a Mobile App reduces Satisfaction by 3.4 Ratings

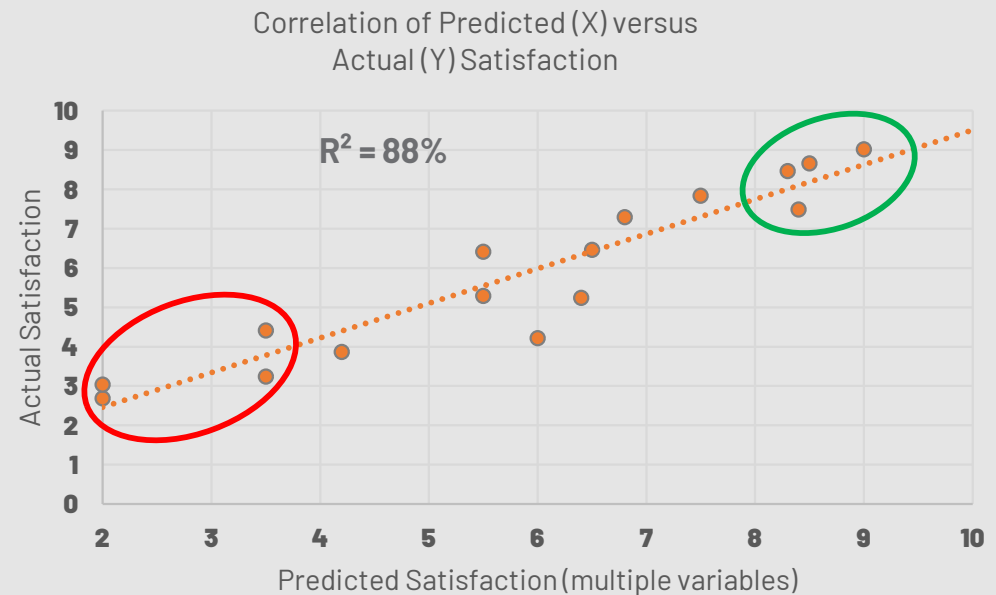
Business Model Equation - Chart

The Business Model Equation has a high correlation strength of 88%.

This means that 88% of the Customer Satisfaction rating can be predicted by the 5 Significant Factors.

The Y axis is the Satisfaction Rating.

The X axis represents the combination of 5 significant factors.



The chart plots 16 product offerings defined by the experiment, yielding different levels of Customer Satisfaction (**low** in bottom left to **high** in the top right).

Factor Contribution

By multiplying each factor's coefficient by the typical average values for each factor we can approximate their contribution.

Factor	%	Direction
Daily Cost	-22	Lower cost is better.
Excess	-9	Lower excess is better.
Claim Limit	+9	Higher claim limit is better.
Mobile App	+45	Having a Mobile App is considerably better.
24/7 Tel Support	+15	Having 24/7 Tel Support is better.

Business Strategy

The Business Model Equation can be used strategically by inputting your choice of variables. To maximise Customer Satisfaction we need to set the following values:

Days Covered -	flexible, customer specifies up to 28 days.
Daily Cost -	\$3.00 (lowest)
Excess to pay -	\$0 (lowest)
Claim Limit -	\$50k (highest)
Mobile App -	Yes (better)
24/7 Tel Support -	Yes (better)

Customer Satisfaction Rating Predicted = 9.83 out of 10.

Business Target Setting

Lets assume this year your business has a Satisfaction target of 8.5.

By adjusting the factors you can develop a customised business model.

Days Covered -	flexible, customer specifies up to 28 days.
Daily Cost -	\$4.50
Excess to pay -	\$250
Claim Limit -	\$50k
Mobile App -	Yes
24/7 Tel Support -	Yes

Customer Satisfaction Rating Predicted = 8.52

Business Target Setting

In the process of adjusting your Business Model you realise that there is opportunity to remove the 24/7 Tele Support. But to do so, the other factors need to be adjusted to compensate while still meeting this year's 8.5 Satisfaction Target.

Days Covered -	flexible,	customer specifies up to 28 days.
Daily Cost -	\$5.25	Slightly above the original \$5.00 limit.
Excess to pay -	\$0	Lowest
Claim Limit -	\$80k	Above the original \$50k tested.
Mobile App -	Yes	Better
24/7 Tel Support -	No	Removed.

Customer Satisfaction Rating Prediction = 8.51

Business Target Setting

For competitive reasons, you have a Daily Cost Target of \$3.50.

The equation can be switched around so the other variables compensate.

Excess to pay -	\$150	Original range \$0 - \$500.
Claim Limit -	\$25k	Original range \$0 - \$50k.
Mobile App -	Yes	
24/7 Tel Support -	Yes	
Satisfaction Rating -	8.56	

Daily Cost Target = \$3.50 Target Met.

Business Model Validation

The Business Model Equation can be used in simple but powerful ways to create business opportunities and an overall business strategy.

The opportunities require proving or validating with new customers.

To validate the model, test each opportunity with a statistically valid sample of new customers.

Ask the customers to Rate their Satisfaction Levels.

Calculate the average Satisfaction Rating from the sample of customers. It should fall within the confidence interval range.

We hope this Case Study has helped you appreciate the power of statistical analysis in delivering business opportunities and an overall strategy from a small data set. Imagine the opportunities with more data!

Data Analysis using Minitab 

Please return to the 1iDEA's website for more tutorials and case studies.

All you need is...



Thank You