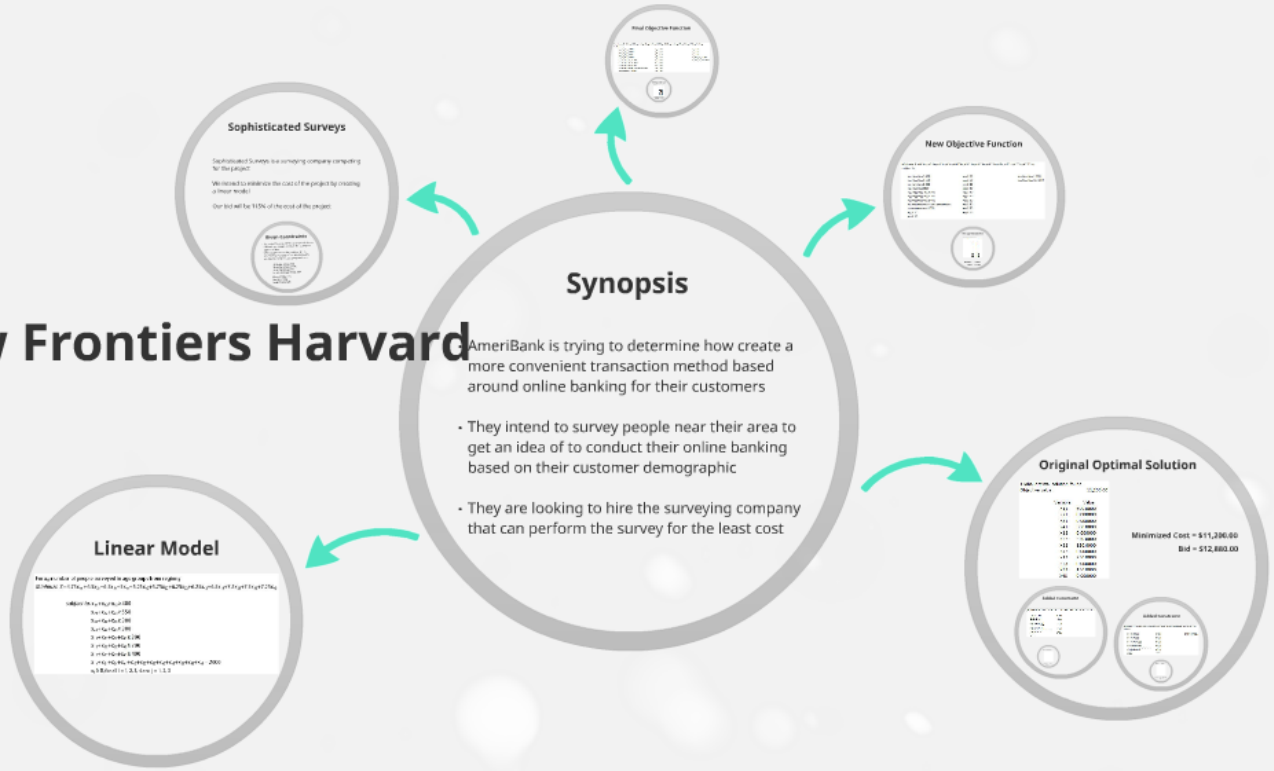
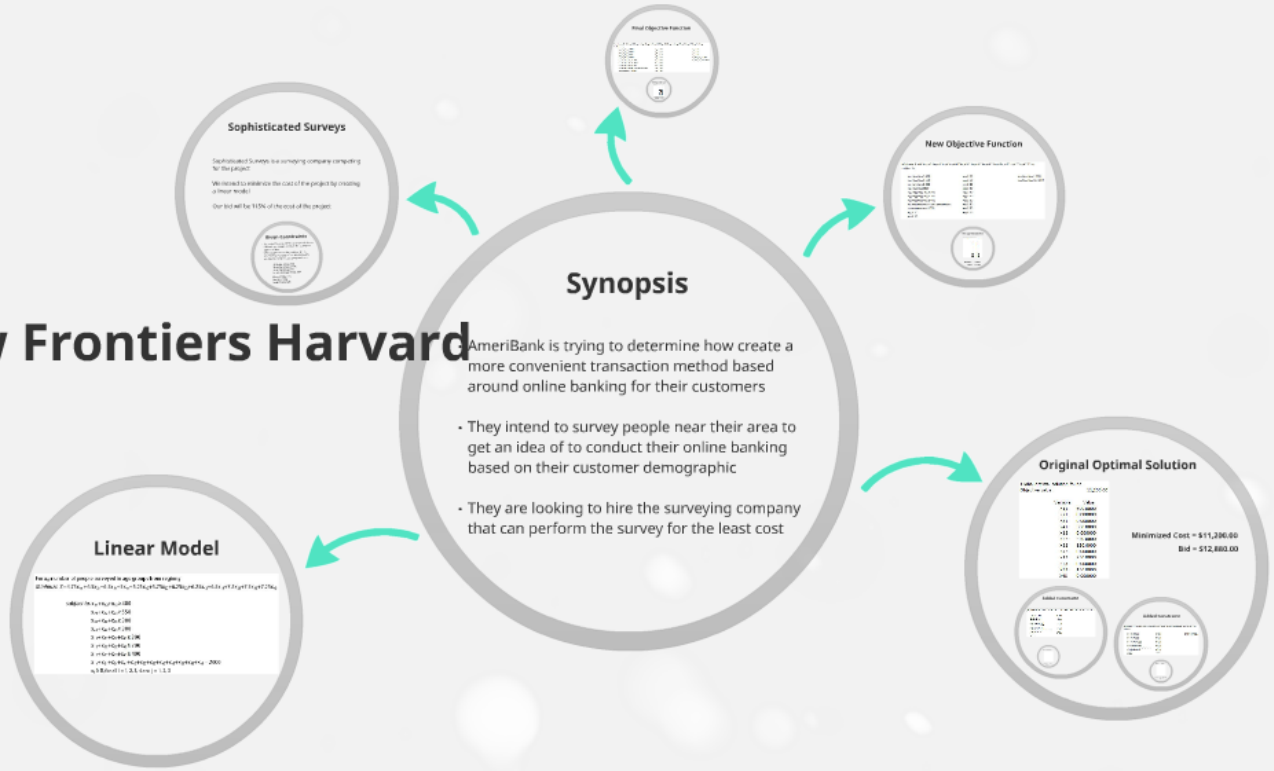
Cookie man- Exploring New Frontiers Harvard Case Solution & Analysis



TheCaseSolutions.com

Cookie man- Exploring New Frontiers Harvard Case Solution & Analysis



TheCaseSolutions.com

Synopsis

AmeriBank is trying to determine how create a more convenient transaction method based around online banking for their customers

- They intend to survey people near their area to get an idea of to conduct their online banking based on their customer demographic
- They are looking to hire the surveying company that can perform the survey for the least cost

Sophisticated Surveys

Sophisticated Surveys is a surveying company competing for the project

We intend to minimize the cost of the project by creating a linear model

Our bid will be 115% of the cost of the project

Given Constraints

- The company would like to survey people in four different age groups and from three different types of towns
- 2,000 people were to be surveyed, given a minimized percentage of the total of people surveyed in the given age group and town

18-25 Age Group: 20%
26-40 Age Group: 27.5%
41-50 Age Group: 15%
51 and over Age Group: 15%

Silicon Valley: 15%
Big Cities: 35%
Small Towns: 20%

Given Constraints

- The company would like to survey people in four different age groups and from three different types of towns
- 2,000 people were to be surveyed, given a minimized percentage of the total of people surveyed in the given age group and town

18-25 Age Group: 20%
26-40 Age Group: 27.5%
41-50 Age Group: 15%
51 and over Age Group: 15%

Silicon Valley: 15%
Big Cities: 35%
Small Towns: 20%

Linear Model

For x_{ij}: number of people surveyed in age group *i* from region *j*

Minimize $Z=4.75x_{11}+6.5x_{21}+6.5x_{31}+5x_{41}+5.25x_{12}+5.75x_{22}+6.25x_{32}+6.25x_{42}+6.5x_{13}+7.5x_{23}+7.5x_{33}+7.25x_{43}$

subject to, $x_{11}+x_{12}+x_{13} \geq 400$

$x_{21}+x_{22}+x_{23} \geq 550$

$x_{31}+x_{32}+x_{33} \geq 300$

$x_{41}+x_{42}+x_{43} \geq 300$

$x_{11}+x_{21}+x_{31}+x_{41} \geq 300$

$x_{12}+x_{22}+x_{32}+x_{42} \geq 700$

$x_{13}+x_{23}+x_{33}+x_{43} \geq 400$

$x_{11}+x_{21}+x_{31}+x_{41}+x_{12}+x_{22}+x_{32}+x_{42}+x_{13}+x_{23}+x_{33}+x_{43} = 2000$

$x_{ij} \geq 0$, for all i = 1, 2, 3, 4 and j = 1, 2, 3

Linear Model

For x_{ij}: number of people surveyed in age group *i* from region *j*

Minimize $Z=4.75x_{11}+6.5x_{21}+6.5x_{31}+5x_{41}+5.25x_{12}+5.75x_{22}+6.25x_{32}+6.25x_{42}+6.5x_{13}+7.5x_{23}+7.5x_{33}+7.25x_{43}$

subject to, $x_{11}+x_{12}+x_{13}\geq 400$

$x_{21}+x_{22}+x_{23}\geq 550$

$x_{31}+x_{32}+x_{33}\geq 300$

$x_{41}+x_{42}+x_{43}\geq 300$

$x_{11}+x_{21}+x_{31}+x_{41}\geq 300$

$x_{12}+x_{22}+x_{32}+x_{42}\geq 700$

$x_{13}+x_{23}+x_{33}+x_{43}\geq 400$

$x_{11}+x_{21}+x_{31}+x_{41}+x_{12}+x_{22}+x_{32}+x_{42}+x_{13}+x_{23}+x_{33}+x_{43}=2000$

$x_{ij}\geq 0$, for all i = 1, 2, 3, 4 and j = 1, 2, 3

Original Optimal Solution

Global optimal solution found.
Objective value: 11,200.00

Variable	Value
X11	600.0000
X21	0.000000
X31	0.000000
X41	300.0000
X12	0.000000
X22	550.0000
X32	150.0000
X42	0.000000
X13	250.0000
X23	0.000000
X33	150.0000
X43	0.000000

Minimized Cost = $11,200.00

Bid = $12,880.00

Added Constraint

Added Constraint