

# Factors Explaining Customer Satisfaction in a CBT Environment

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# Agenda

- Background
- Problem & Purpose
- Data Information
- Analysis
- Interpretation & Explanation
- Recommendations

# Background – Thomson Prometric

- Computer-based testing company (GMAT, Microsoft certification, etc.)
- Network of testing centers operated by third-party partners
- Measure testing center performance across many dimensions

# Problem

- Declining client satisfaction (perceived)
- Increasingly competitive environment
- Limited capital investment funds

## **Purpose:**

Identify what factors affect customer satisfaction and the degree to which customer satisfaction impacts the likelihood for repeat business.

# Data Information - Surveys

- Customer satisfaction surveys
  - Ten question survey delivered after candidate completes exam
  - Exam questions measure four areas:
    - Procedures
    - Environment
      - Customer service
      - Computer equipment
      - Lighting
      - Room appearance
      - Sound
      - Temperature
    - Service
    - Overall
  - Results presented in Likert scale (1 – 5)

# Data Information - Sample

TestingID	Invoice	Client	Region	Pass/Fail	Survey?	Service	Comp Equip	Lighting	Appear	Sound	Temp	Overall	Return
570812057	h9adtt0120	Microsoft	NA	1	Yes	4	4	4	3	5	5	5	0
613366003	h9edtt06c0	Microsoft	NA	1	Yes	5	5	5	5	5	5	5	0
251635523	h9fdtt01f6	Microsoft	NA	1	Yes	4	5	3	5	5	5	5	0
41625436	ha3dtt09a6	Microsoft	NA	0	Yes	5	5	5	5	2	3	4	1
533063493	hb3dtt0803	Microsoft	NA	1	Yes	5	5	5	5	5	5	5	0
219138738	hcddtt049d	Microsoft	NA	0	Yes	5	5	5	5	5	5	5	0
sp9179991	d0syd0229	Microsoft	SYD	1	Yes	4	4	4	4	1	4	4	0
sp2809849	nd6lon0141	Microsoft	EMEA	1	Yes	5	5	5	5	5	5	5	0
sp2124638	ndelon0199	Microsoft	EMEA	1	Yes	3	3	5	3	3	3	4	0
435698724	hf2dtt09d2	Microsoft	NA	1	Yes	3	3	3	2	2	3	3	0
595368730	hf5dtt00c5	Microsoft	NA	1	Yes	5	5	5	5	5	5	5	0
332444310	hffdtt00d2	Microsoft	NA	0	Yes	3	3	3	3	3	3	3	0
403029718	i0ddtt03d8	Microsoft	NA	1	Yes	5	3	5	5	5	5	4	0
149880169	i10dtt074e	Microsoft	NA	1	Yes	4	4	5	4	4	5	4	0
152740517	i1adtt07c9	Microsoft	NA	0	Yes	3	3	3	3	3	3	3	0
sp2894843	i24lon00d1	Microsoft	EMEA	0	Yes	5	4	3	5	5	4	4	0
420064741	i37dtt076d	Microsoft	NA	1	Yes	4	4	4	4	4	4	4	0
sp2798675	i3flon0189	Microsoft	EMEA	1	Yes	5	5	5	5	5	3	5	0
492841201	i59dtt07db	Microsoft	NA	1	Yes	5	3	4	5	5	5	4	0
227948846	i5cdtt0458	Microsoft	NA	1	Yes	5	5	5	5	5	2	5	0
sp9388217	68dus00d4	Microsoft	EMEA	0	Yes	5	5	5	5	5	5	5	1
sp2680783	i75lon02d3	Microsoft	EMEA	1	Yes	3	3	3	3	4	3	3	0
475726280	i76dtt003f	Microsoft	NA	1	Yes	5	5	5	5	5	5	5	0

# Data Information - Preparation

- Started with survey data from candidates testing in May across four major clients
- Collected Return variable over the next four months
- Cross-tabulations in Access along with minor clean-up in Excel
- Deleted records with Missing Data
- Reviewed summary statistics for each client and based upon inconsistencies in the data narrowed analysis to single (and largest client)

# Data Information – Summary Statistics

- Total Microsoft records = 7,567
- Candidate return rate = 37%
- Pass rate = 90%
- Candidate return rate for those choosing not to complete the survey = 41%

# Analysis – Predicting Candidate Satisfaction

- Multiple linear regression
  - Treated 5-point Likert scale responses as continuous variables
  - Analyze predictors of Overall candidate satisfaction
    - Pass/Fail
    - Customer service
    - Computer equipment
    - Lighting
    - Test room appearance
    - Sound
    - Temperature
  - Response variable: Overall

# Analysis – Output

## The Regression Model

Input variables	Coefficient	Std. Error	p-value	SS
Constant term	0.23696846	0.0528303	0.00000905	104101.27
Pass/Fail	0.49705553	0.0257442	0	261.61652
Service	0.49249154	0.0129922	0	1494.7269
Comp Equip	0.10177852	0.0113744	0	172.16801
Lighting	0.01544117	0.0138578	0.2657086	19.207859
Appear	0.05864713	0.0140873	0.00003702	28.987846
Sound	0.09423003	0.0095224	0	39.597054
Temp	0.05400888	0.0106538	0.00000056	8.2528267

Residual df	5668
Multiple R-squared	0.526581106
Std. Dev. estimate	0.56668305
Residual SS	1820.163208

# Analysis – Predicting Candidate Return

- Logistic regression
  - Treated 5-point Likert scale responses as continuous variables
  - Analyze predictors of whether a candidate returns to test again
    - Pass/Fail
    - Customer service
    - Computer equipment
    - Lighting
    - Test room appearance
    - Sound
    - Temperature
    - Overall
  - Response variable: Return

# Analysis – Output

## The Regression Model

Input variables	Coefficient	Std. Error	p-value	Odds
Constant term	-0.20171702	0.1952266	0.301489	*
Pass/Fail	0.67635572	0.1069647	0	1.9666975
Service	-0.18281423	0.0531724	0.0005857	0.8329229
Comp Equip	0.01927554	0.0421086	0.6471267	1.0194625
Lighting	-0.02409449	0.0507094	0.6346812	0.9761935
Appear	-0.0569694	0.0514947	0.2685902	0.944623
Sound	-0.02442317	0.0351925	0.4876891	0.9758726
Temp	0.08577363	0.0398057	0.0311768	1.0895597
Overall	-0.02951553	0.0494418	0.550524	0.9709158

# Analysis

- Likert scale causes data to be suspect when predicting return of candidates
- Results are inconclusive

Service	Return		Total	Return%	Grouping
	No	Yes			
1	18	9	27	33%	33%
2	52	25	77	32%	
3	228	185	413	45%	37%
4	932	658	1590	41%	
5	2359	1210	3569	34%	

# Analysis

- Similarity in questions for responses lead to results dependency

Count of Return	Lighting				
Service	1	2	3	4	5
1	<b>4</b>	1	3		
2	3	<b>7</b>	7	4	5
3	8	7	<b>77</b>	47	27
4	4	18	67	<b>282</b>	150
5	9	10	44	214	<b>889</b>

**Chi-square test statistic**

892.886

9.2255E-180

# Interpretation & Explanation

- Managerial implications
  - To create a better model, better predictors must be identified
    - Number of exams left in certification track
    - Location of nearest competitor
    - Formal training versus self-study
  - Likert scale may be ineffective in providing information for some management decisions

# Recommendations

- Policy recommendations
  - Re-evaluate Likert scale survey questionnaire as sole means for making strategic decisions
    - Focus groups
    - Open-ended questions (example: why did you choose this testing center?)
  - Utilize data to identify problem sites requiring management attention
  - Identify incentives to motivate candidates to complete survey