



**Patient satisfaction survey data analysis  
and suggestions for the healthcare  
leadership**

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# **TECHNICAL CASE STUDY**

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# Executive Summary

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## Background - U.S. Hospital Customer Satisfaction survey

Results **directly impact the hospital's finance** and a healthcare organization's **reputation** because they are publicly reported on the internet for all to see, and patients' word-of-mouth plays a key role in attracting more customers to the organization.



## Our Mission

In order to keep the hospital financially strong with a high reputation, encouraging word-of-mouth **'Recommendation Intention'** indicator is imperative.



## The Problem - Analysis Purpose

The unexplained relationship between 'Recommendation Intention' and other indicators. We must **uncover the relationship to identify key indicators** for boosting word of mouth.



## The Solution - Recommendation

Focus on improving a specific area of scores would efficiently drive a higher 'Recommendation Intention'.  
→ **'Preference Acceptance', 'Patients' understanding of healthcare responsibilities'**



# Contents

**Data Overview**

**Next Steps**

**Analysis &  
Findings**

**Recommendations**

- Simple linear regression analysis
- Linear regression model
- Correlation analysis

# 01. Data Set: Patient Satisfaction Survey

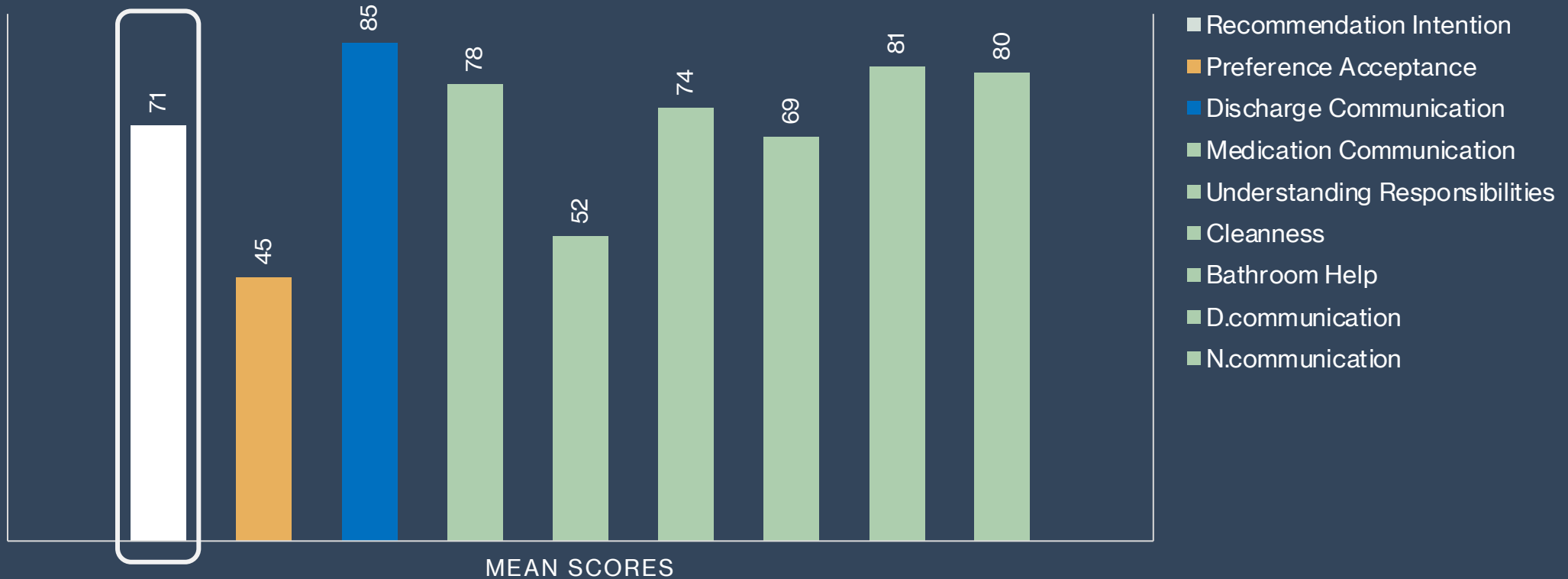
- 3397 healthcare organizations’ survey results with 9 indicators
- Consisted of a series of questions that evaluate key elements of the patient experience.

Facility Name		Recommendation Intention	Preference Acceptance	Discharge Communication	Medication Communication	Understanding Responsibilities	Cleanness	Bathroom Help	D.communication	N.communication
0	A R GOULD HOSPITAL	62.0	47.0	84.0	78.0	50.0	80.0	72.0	80.0	80.0
1	ABBEVILLE AREA MEDICAL CENTER	85.0	44.0	85.0	81.0	50.0	76.0	82.0	88.0	88.0
2	ABBEVILLE GENERAL HOSPITAL	68.0	56.0	80.0	83.0	63.0	88.0	71.0	88.0	85.0
3	ABBOTT NORTHWESTERN HOSPITAL	82.0	50.0	86.0	80.0	58.0	74.0	71.0	84.0	82.0
4	ABILENE REGIONAL MEDICAL CENTER	69.0	43.0	82.0	73.0	49.0	70.0	67.0	82.0	79.0
...	...	...	...	...	...	...	...	...	...	...
3393	YORK HOSPITAL	75.5	51.0	86.0	81.0	57.0	72.5	70.5	82.0	84.0
3394	YUKON KUSKOKWIM DELTA REG HOSPITAL	57.0	28.0	82.0	81.0	36.0	58.0	66.0	76.0	76.0
3395	YUMA REGIONAL MEDICAL CENTER	63.0	39.0	85.0	72.0	46.0	71.0	62.0	73.0	76.0
3396	ZUCKERBERG SAN FRANCISCO GENERAL HOSP & TRAUMA...	72.0	42.0	85.0	74.0	49.0	75.0	59.0	76.0	74.0
3397	Mean	70.8	45.2	84.6	78.0	51.5	74.2	69.0	80.7	80.0
3398 rows x 10 columns										

*CMS releases this quality data publicly in order to encourage hospitals to improve their quality and to help consumers make better decisions about which providers they visit.*

# 01. Data Set: Overview

➤ Mean of 'Recommendation Intention': 71



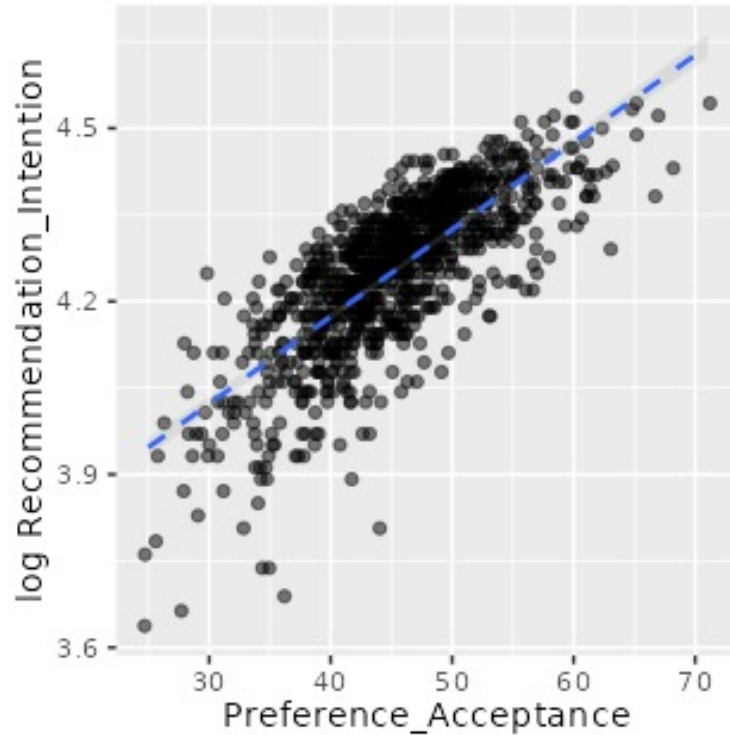
***The Problem: How to effectively improve 'Recommendation Intention'? Which indicators should we focus on?***

# 02. Analysis & Findings

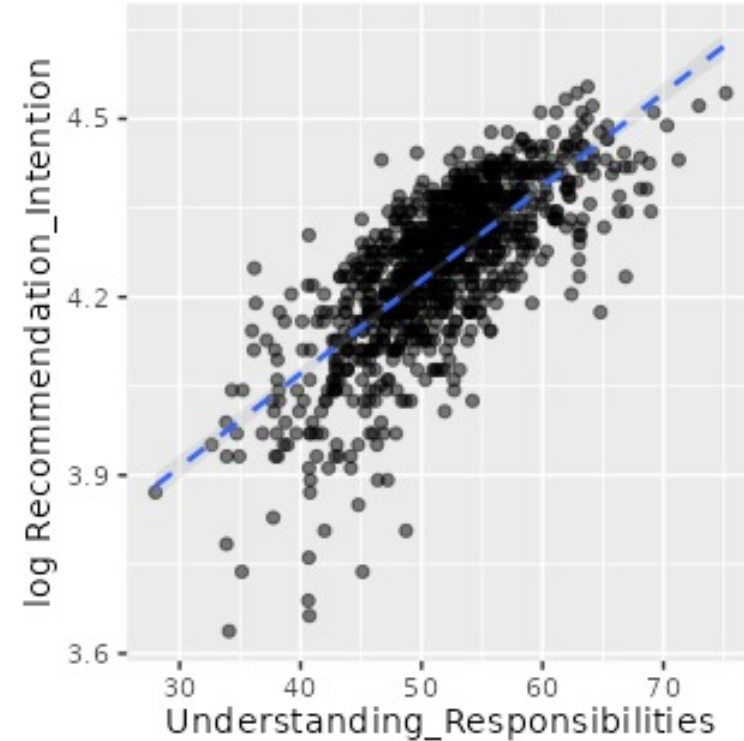
## 1) Linear Relationships between Rating and other variables

- **Positive linear relationship:** As one gets a higher score, the other gets a higher score as well

### 1 Strong Positive



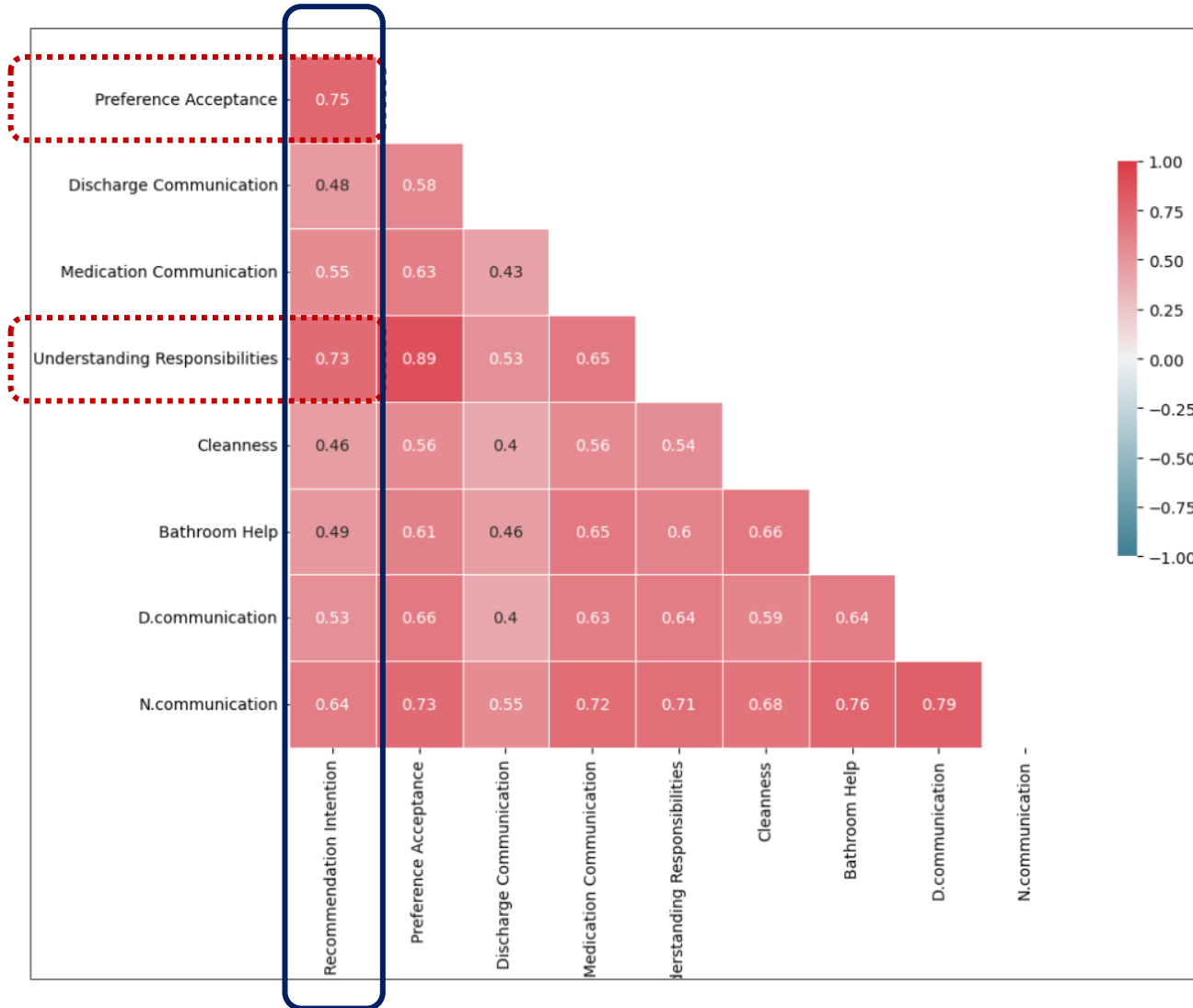
### 2 Strong Positive



***Strong positive relationships with 'Recommendation Intention':  
'Preference Acceptance', 'Patients' understanding of healthcare responsibilities'***

# 02. Analysis & Findings

## 2) Correlation between Rating and other variables



### Correlation matrix analysis

➤ Highest positive correlation with  
'Recommendation Intention':

1) 'Preference Acceptance' (0.75)

2) 'Patients' understanding of healthcare responsibilities' (0.73)

✓ It quantifies the degree to which two variables are related and shows the direction and strength of the association between two numeric variables.

# 02. Analysis & Findings

## 3) Linear regression model: Hypothesis test

- Strong positive coefficients & p.value of  $<.001$  indicate to accept the alternative hypothesis
- Combination of three indicators below would perform to boost the 'Recommendation Intention'

```
Linear regression (OLS)
Data      : recom3
Response variable   : Recommendation_Intention
Explanatory variables: Preference_Acceptance, Understanding_Responsibilities, N_communication
Null hyp.: the effect of x on Recommendation_Intention is zero
Alt. hyp.: the effect of x on Recommendation_Intention is not zero
**Standardized coefficients shown (2 X SD)**
```

	coefficient	std.error	t.value	p.value
(Intercept)	0.000	0.006	0.000	1.000
Preference_Acceptance	0.411	0.026	15.953	$<.001$ ***
Understanding_Responsibilities	0.247	0.025	9.859	$<.001$ ***
N_communication	0.167	0.016	10.156	$<.001$ ***

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

R-squared: 0.596, Adjusted R-squared: 0.596  
F-statistic: 1630.114 df(3,3311), p.value  $<.001$   
Nr obs: 3,315

Variance Inflation Factors

	Preference_Acceptance	Understanding_Responsibilities	N_communication
VIF	5.439	5.129	2.209
Rsq	0.816	0.805	0.547



# 03. Recommendations

The best usage of limited assets to effectively raise the 'Recommendation Intention'

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***The Solution: Above the two ultimate key indicators to focus on for the best result.***

# 04. Next Steps

Actionable frameworks for the solution indicators:

*‘Preference Acceptance’, ‘Patients’ understanding of healthcare responsibilities’*

## ○ Personal Care

Use the patient’s name, ask questions involving the patient in their care, and deliver the customized service.

## ○ Non-medical Language

Empower patients to take charge of their health by offering detailed healthcare information with understandable words.

## ○ Establish a sense of trust

Taking a few minutes to engage with a patient before explaining medicines would help establish trust between patients and staff.



*Areas for further consideration : Caring for caretakers, Upgrading outdated systems, Cafeteria*

**Thank you!**

