

IMPACT OF ARCHITECTS INFLUENCE IN CHOOSING THE ELEVATOR BRAND

Abstract

This research focuses on elements that Architects look for in an elevator brand, and importance of those in influencing the customer to choose one among other competitors in the market. Also, research intends to study how elevator manufacturers are responding to contemporary issues. The study is empirical and primary data was collected from Architects using questionnaires. From the study it is evident that over 78% of the Architects always involve and 16% somewhat involve in decision making process.

Hence it is necessary for the Elevator Manufacturers to create the awareness of their Brand and their product attributes among the Architects to get the competitive advantage over other Brands. Architects recommend the Brand with better Company attributes. The elevator Manufacturers should focus more on creating this attribute by building better Brand image through brand visibility, increasing the number of prime reference projects, focusing on the experience of the customers throughout the execution of the project.

Keywords: Elevator Brand, Architects choice, Marketing.

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I. INTRODUCTION

Elevators are used to transport people and things between levels in any structure. Elevators have become an essential feature of every construction structure in recent decades. We rely on them for vertical mobility in workplaces, schools, public buildings, airports, and sub-stations in our daily lives. Elevators are an important part of the construction industry, with over 4 million in use today. Consider that nowadays, elevators transport the equivalent of the world's population every 72 hours to get a sense of the impact of this one accomplishment. As a result, it is unquestionably an important segment of the construction industry and a significant study issue. Architects, consultants, builders, developers, project managers, and building owners are some of the industry's different stakeholders who contribute to the elevator business.

Among them all, Architects are essential from the beginning of a project through its end. They're in charge of the buildings' and structures' visual look prior to final structural design. Architects oversee keeping track of numerous contracts, project specifics, project value and, as a result, budget information, and the cut-off date and, as a result, the day-by-day written report. Most of the time, architects must collaborate with civil or structural engineers to communicate and debate technical concerns that arise throughout the design and, as a result, execution. Their responsibilities also include project discussion, drawing preparation (including the floor plan, site plan, elevation, and hence isometric views), other comprehensive structural drawings, and 3D models.

The architect's responsibility also extends to tender bidding and permitting the building contract to be assigned with the architect's aid. This aids the customer in choosing the appropriate procurement form. The entire contract procedure will be well-coordinated in this manner. Contract agreement activities must be open and equitable. Architects are responsible for recommending and hiring contractors for various building operations. The architect does a youthful analysis study after obtaining the tender. The client's expectations and budget are contrasted to the results. With the global elevator business increasing and numerous manufacturers vying for market share, it's critical to understand where different elevator brands stand in relation to Architects' expectations.

II. REVIEW OF LITERATURE

The American Marketing Association (AMA) defines a brand as a "name, word, sign, symbol, design, or a combination of them, designed to spot the products or services of one seller or group of sellers and to differentiate them from those of competitors" (Kotler and Keller 2006:274).

A brand is a product or service that adds characteristics that distinguish it from other products or services that are created to meet the same purpose. Supporting Kotler and Keller's view of a brand as a name, term, sign, symbol, design, or a combination of these, Rosetti (2005) proposed in an extremely presentation that a brand could be a name, term, sign, symbol, design, or a mixture of these, intended to distinguish the products and services of one seller or group of sellers from those of competitors. A brand is thus a product, but one with additional qualities that distinguish it from other items trying to meet the same demand.

According to Keller (2003), the ability to pick a reputation, logo, symbol, packaging design, or other features that identify a product and separate it from others is the key to creating a brand. Brand elements are the numerous characteristics of a brand that distinguish and differentiate it. Inside secondary sources, two viewpoints of brands emerge: one links the weather within the definition of a brand to the tangibles that create the brand, and the other links the brand to intangible conceptions. The latter comes from a marketing communications standpoint, whereas the former comes from a traditional marketing standpoint. Nandan (2005) elaborates on the intangible qualities of a brand, stating that brands are intangible assets that may be used to create tangible goods.

Research and Markets (2019) predicted the global elevators and escalators market is going to achieve over \$107 billion by 2024, growing at a CAGR of around 6% during 2018-2024. KONE, Otis Elevators, and Schindler are major competitors in the global market. The global elevators and escalators market is surfacing due to the varying dynamics of the global construction industry. Advancements in vertical transportation have contributed to transform the construction sector, which enabling the growth of high-rise buildings. This has fueled the need to install elevators and escalators in premises.

Tarun (2018) opined that, in a very country like India where urbanization and population explosion is at its peak, developers are encouraged to construct high-rise buildings, which successively have fuelled demand for elevators. Every urbanized citizen who is exposed to the innovative international technologies is now looking to settle in societies which not only comes equipped with state-of-the-art facilities but also offers faster vertical movement at safe speeds. Another factor driving elevator industry is investments in infrastructure and commercial projects. Increased target on developing, expanding, modernizing airports, development of metro rail projects and redevelopment of railway stations, offers opportunities within the infrastructure segment within the future.

III. RESEARCH GAP

The construction industry is highly fragmented, with an infinite number of Developers, Builders, and Architects; also, tastes, preferences, and historical practices differ greatly from city to city. As a result, a sound marketing plan necessitates an in-depth research study based on accurate data inside the target cities. This research focused on the market studies, trends, and projections for the elevator industry's expansion. Manufacturers are attempting to increase their market share by reaching out to a larger number of customers, but they are seeing a pricing war among competitors, which is eroding profitability. Recognizing the importance of diverse elevator brands, several ways for engaging architects to generate brand awareness are being developed. This is because architects play a key function in the tip user's higher cognitive process. However, there is no investigation of what variables are crucial to Architects in determining their choice and recommending a specific Elevator Brand.

IV. OBJECTIVES

1. To analyze the significance of different Product Attributes and Company Attributes that are important for the Architects while choosing an Elevator Brand.

2. To identify the critical factors among them that impacts the Architects to recommend the customers for a particular Brand of Elevator.
3. To assess different Brands with respect to Product Attributes and Company Attributes.

V. RESEARCH HYPOTHESIS

1. **H1:** There is significant difference between company attributes and product attributes of the elevator
2. **H2:** There is significant difference in Architects perception of the product attributes among the various elevator brands
3. **H3:** There is significant difference in Architects perception of the company attributes among the various elevator brands

VI. RESEARCH METHODOLOGY

Vertical Transport Industry has witnessed a rapid growth in the recent years. With the number of high-rise buildings rapidly growing in India, elevator manufacturers are gearing up to seize the rising business opportunities. It is important for the Elevator Manufacturers to know about the Influencers of the customers involved in the decision process and the impacting factors to these influencers. Our research explores the different factors impacting the Architects to recommend a particular Brand.

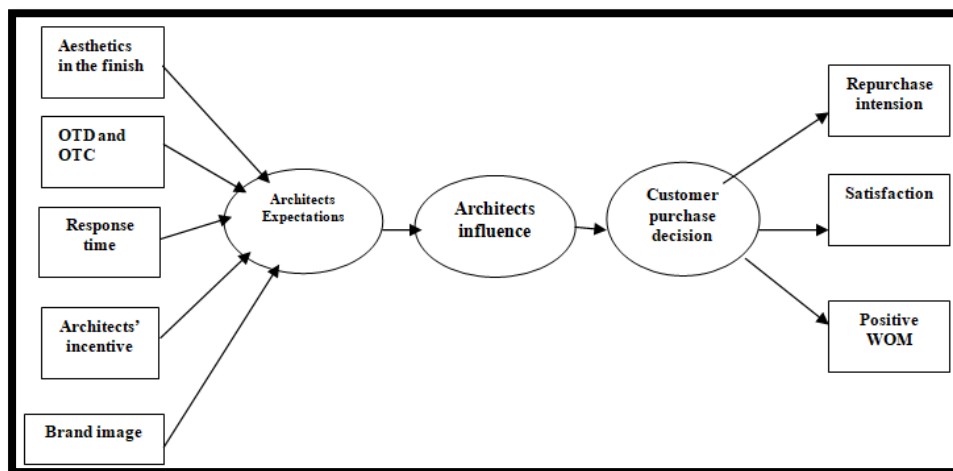


Figure 1: Conceptual Framework

VII. METHOD OF DATA COLLECTION

The study is based on collecting primary data which is a fresh and is done for the first time. This data is collected by circulating the questionnaire among the Architects individually by inviting them to fill the Google form and collating the responses.

VIII. RESEARCH DESIGN

A sample design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items for the sample. Sampling Technique The study used non-probability sampling as its sampling

method. Convenience sampling was used to choose the respondents. Because of time constraints, a lack of comprehension of the whole universe, and the fact that gathering information from all of the Architects around the city will be difficult, this testing approach will be used.

IX. DATA ANALYSIS AND INTERPRETATION

Objective 1: To identify the critical factors among Product attributes and Company attributes that impacts the Architects to recommend the customers for a particular Brand of Elevator.

1. Factor analysis: A factor analysis was performed to discover crucial characteristics among the several attributes that have the greatest influence on Architects. The Exploratory Factor Analysis is carried out with two sets of variables, Product Attributes and Company Attributes, which are used to describe the product and company, respectively. In each area, the factor analysis discovered three essential criteria that have a significant influence on the Architect's selection.

Analysis on product attributes

Table 1:

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
Aesthetics of the lift finishes	4.22	0.582	50
Safety & Product Quality	4.44	0.733	50
Longevity	4.12	0.746	50
Price	3.74	0.876	50
Technology Power efficiency	4.14	0.67	50

Sources: Descriptive Statistics

Table 2:

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.64	
Bartlett's Test of Sphericity	Approx. Chi-Square	92.057
	Df	10
	Sig.	0.000

Sources: KMO & Bartlett's test

Table 3:

Total Variance Explained						
Component	Initial Eigen values		Cumulative %	Extraction Sums of Squared Loadings		
	Total	% of Variance		Total	% of Variance	Cumulative %
1	2.536	50.728	50.728	2.536	50.728	50.728
2	1.035	20.69	71.418	1.035	20.69	71.418
3	0.911	18.217	89.635	0.911	18.217	89.635
4	0.356	7.117	96.752			
5	0.162	3.248	100			
Extraction Method: Principal Component Analysis.						

Sources: Squared loadings

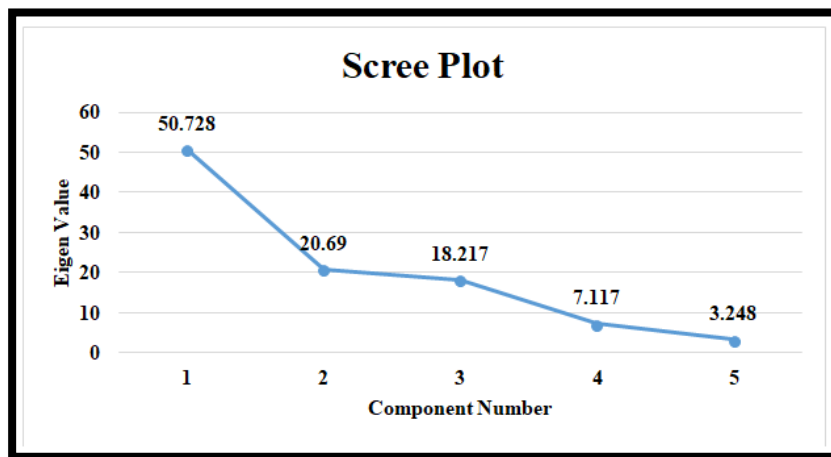


Figure 1: Screen plot

Table 4: Rotated Component Matrix

Rotated Component Matrix^a			
	Component		
	1	2	3
Safety & Product Quality	0.95		
Longevity	0.901		
Technology Power efficiency	0.672	0.55	
Price		0.961	
Aesthetics of the lift finishes			0.998
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.^a			
a. Rotation converged in 5 iterations.			

Interpretation: Five Products attributes items such as Aesthetics of the elevator, Safety and product Quality, Longevity, Price, Technology and Power Efficiency were subjected to Principal axis factoring to assess the dimensionality of the data. The Kaiser-Meyer-Olkin was 0.64 which is above the recommended threshold of 0.6 (Kaiser, 1979) and Bartlett’s Test of Sphericity reached statistical significance indicating the correlations were significantly large for exploratory factor analysis.

Three factors were extracted explaining 89.635% of the variance. This was decided based on the eigen values, cumulated variance and inspection of the scree plot. Factors were rotated using Varimax Rotation since the correlation between the **variables** were not so higher than 0.3. Items with high factor loading is Aesthetics of the lift finishes which is loaded in component 3 with 0.998. The second highest is Price in component 1 loaded with a factor loading of 0.961. The third highest is the Safety and Product Quality with a factor loading of 0.95 in component 2.

Analysis on Company Attributes

Table 5: Descriptive Statistics

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
Brand image	4.2	0.782	50
Reference Projects	4.04	0.699	50
Past experience with the brand	4.44	0.644	50
Response time and service	4.24	0.744	50
On time Delivery and completion	4.16	0.681	50

Table 6: KMO and Bartlett’s test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.638
Bartlett's Test of Sphericity	Approx. Chi-Square	79.192
	df	10
	Sig.	.000

Table 7: Squared loadings

Total Variance Explained						
Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.537	50.740	50.740	2.537	50.740	50.740
2	1.110	22.208	72.947	1.110	22.208	72.947
3	.695	13.903	86.850	.695	13.903	86.850
4	.452	9.030	95.880			
5	.206	4.120	100.000			

Extraction Method: Principal Component Analysis.

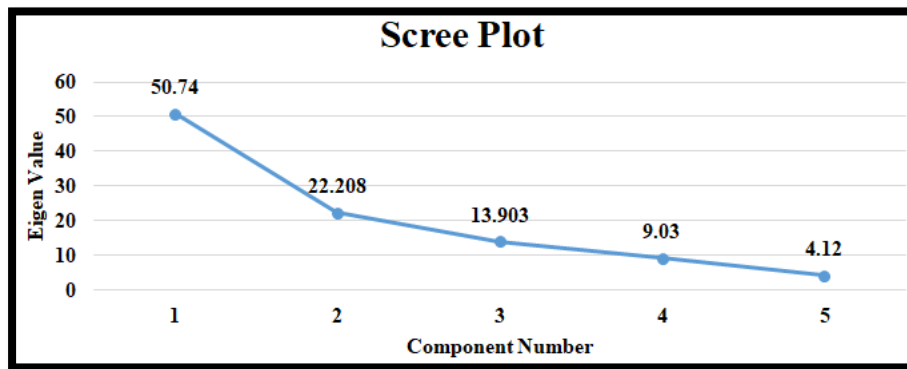


Figure 2: Screen plot

Table 8: Rotated Component Matrix

Rotated Component Matrix ^a			
	Component		
	1	2	3
Response time and service	.941		
On time Delivery and completion	.861		
Past experience with the brand	.758	.391	
Reference Projects		.955	
Brand image			.988
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization. ^a			
a. Rotation converged in 5 iterations.			

Interpretation: Similarly, five Companies attributes items such as Brand Image, Reference Projects, On Time Delivery & Completion, past experience with the Brand and Response Time were subjected to Principal axis factoring to assess the dimensionality of the data. The Kaiser-Meyer-Olkin was 0.638 which is above the recommended threshold of 0.6 (Kaiser, 1979) and Bartlett’s Test of Sphericity reached statistical significance indicating the correlations were significantly large for exploratory factor analysis.

Three factors were extracted explaining 86.85% of the variance. This was decided based on the Eigen values, cumulated variance, and inspection of the screen plot. Factors were rotated using Varimax Rotation since the correlation between the variables were not so higher than 0.3.

Items with high factor loading is Brand Image which is loaded in component 3 with 0.988. The second highest is Reference Project in component 2 loaded with a factor loading of 0.955. The third highest is the Response Time and Service with a factor loading of 0.95 in component

Objective 2: To assess the importance between the Product attributes and Company Attributes

One way ANOVA: A one-way between subjects ANOVA was conducted to compare the effect of different attributes on Architects in Brand Preference, among Company Attributes and Product Attributes.

Table 9: ANOVA

ANOVA						
		Sum of Squares	Df	Mean Square	F	Sig.
Company Attributes	Between Groups	2.973	4	.743	3.883	.009
	Within Groups	8.614	45	.191		
	Total	11.587	49			
Product Attributes	Between Groups	1.727	4	.432	1.943	.120
	Within Groups	10.002	45	.222		
	Total	11.729	49			

Interpretation: There is a significant impact of company attributes on Architects Brand Preference at the $p < 0.05$ level for the conditions $[F(4,45)=3.883, p=0.009]$ than the Product Attributes. Therefore the hypothesis that there is significant difference between company attributes and product attributes of the elevator is accepted.

Objective 3: To assess different Brands with respect to the Company Attributes

Post Hoc Tests

Table 10: Post Hoc Tests

Multiple Comparisons							
Tukey HSD							
Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Company Attributes	KONE	Schindler	.13369	.16930	.932	-.3474	.6147
		Otis	.14379	.18036	.930	-.3687	.6563
		Johnson	.71324*	.18759	.004	.1802	1.2463
		Other	.02824	.22259	1.000	-.6042	.6607
	Schindler	KONE	-.13369	.16930	.932	-.6147	.3474
		Otis	.01010	.19665	1.000	-.5487	.5689
		Johnson	.57955*	.20330	.049	.0019	1.1572
		Other	-.10545	.23598	.991	-.7760	.5651
	Otis	KONE	-.14379	.18036	.930	-.6563	.3687
		Schindler	-.01010	.19665	1.000	-.5689	.5487
		Johnson	.56944	.21260	.073	-.0346	1.1735
		Other	-.11556	.24404	.989	-.8090	.5779
	Johnson	KONE	-.71324*	.18759	.004	-1.2463	-.1802
		Schindler	-.57955*	.20330	.049	-1.1572	-.0019
		Otis	-.56944	.21260	.073	-1.1735	.0346
		Other	-.68500	.24943	.063	-1.3937	.0237
	Other	KONE	-.02824	.22259	1.000	-.6607	.6042
		Schindler	.10545	.23598	.991	-.5651	.7760
		Otis	.11556	.24404	.989	-.5779	.8090
		Johnson	.68500	.24943	.063	-.0237	1.3937

*The mean difference is significant at the 0.05 level.

Interpretation: Post hoc comparisons using the Tukey HSD test indicated that Johnson is significantly different than KONE with $p=0.004$ and Schindler with $p=0.049$ in Company attributes. However, Otis did not significantly differ from Johnson. Also, there is no significant difference between the KONE and Schindler. Taken together, this result suggests that Architects perceives KONE and Schindler better than Otis and Johnson in company attributes. Therefore the hypothesis that there is significant difference in Architects perception of the company attributes among the various elevator brand is accepted

Objective 4: To assess different Brands with respect to the Product Attributes.

One Way ANOVA: A one-way between subjects ANOVA was conducted to compare the effect of different attributes on Architects in Brand Preference, among Attributes and Product Attributes.

Table 11: ANOVA

ANOVA						
		Sum of Squares	Df	Mean Square	F	Sig.
Kone Product Attribute	Between Groups	3.595	4	.899	2.580	.049
	Within Groups	15.673	45	.348		
	Total	19.267	49			
Schindler Product Attribute	Between Groups	4.288	4	1.072	2.922	.031
	Within Groups	16.512	45	.367		
	Total	20.800	49			
Otis Product Attribute	Between Groups	5.475	4	1.369	2.659	.045
	Within Groups	23.166	45	.515		
	Total	28.641	49			
Johnson Product Attribute	Between Groups	3.349	4	.837	2.171	.088
	Within Groups	17.356	45	.386		
	Total	20.705	49			

Interpretation: There is a significant difference between the product attributes of Johnson when compared with KONE, Schindler and Otis as perceived by the Architects. KONE at the $p<0.05$ level for the conditions $[F(4,45)=3.595, p=0.049]$ Schindler at the $p<0.05$ level for the conditions $[F(4,45)=4.288, p=0.031]$ Otis at the $p<0.05$ level for the conditions $[F(4,45)=5.475, p=0.045]$ This results suggests that Architects perceives KONE, Schindler and Otis better than Johnson in Product attributes. Therefore, the hypothesis that there is significant difference in Architects perception of the product attributes among the various elevator brands is accepted.

X. FINDINGS AND SUGGESTIONS

The literature review of the paper has revealed various factors such as Product attributes and Company attributes impacts the Architects to recommend a particular Brand of Elevator to their customer. In order to analyse this, primary research was conducted among the Architects in Bangalore. The acquired information was further analyzed through SPSS wherein test has revealed significant interconnection existing between the chosen variables. The variable chosen for this study were Company attributes such as Brand Image, Reference

Projects, Past experience with the Brand, Response time & Services, OTD & OTC, and Product attributes such as Aesthetics of the lift finish, Safety & Product Quality, Longevity, Price, Technology & Power efficiency. From the results of the data analysis,

XI. CONCLUSION

From the analysis and interpretation of the data, which was collected through the survey, we have concluded that there are few critical factors that have direct impact on the Architects influence to the customer in choosing a particular elevator brand. The study is conducted among different Product attributes and Company attributes of the elevator manufacturers. Among the different Product attributes, Aesthetics of the lift finishes, Price and Safety & product Quality has greater impact on the Architects than other attributes of the product. Similarly, among the different Company attributes, Brand Image, Reference Projects, and Response time & Service has greater impact on the Architects than other attributes of the company. Between the Company attributes and Product attributes, Architects perceive Company attributes more important than the product attributes and have positively impacted on the purchase decision. Further, the analysis shows that Architects perceive Kone and Schindler as the Brand with better Company attributes than Otis & Johnson. However, they perceive KONE, Schindler and Otis as the Brand with better Product attributes than Johnson in Bangalore, where the research is conducted.

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