

MEASURING THE EFFECTIVENESS OF BUYERS DECISION TOWARDS WINDOW MARKET

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1 INTRODUCTION

Windows:

“A window is an opening in a wall of a building that allows light and air to enter a room and people to see out”

A window is a transparent opening in a wall or door that allows the passage of light and, if not closed or sealed, air and sound. Windows are usually glazed or covered in some other transparent or translucent material like a float glass. Windows are held in place by frames, which prevent them from collapsing in. Many glazed windows may be opened, to allow ventilation, or closed, to exclude inclement weather. Window to the building are as eyes to the face. They are the visual links between inside and the outside of the worldp[1-6].

Materials Frames

- Wood
- Aluminium
- uPVC

A Builder's Perspective

Donley has been buying Atria's clad wood line for over 15 years, but recently, he was approached by a national wood window manufacturers, asking him to consider its products instead. Although satisfied with Atria's products and services, he stated there were reasons for considering a change[7-11].

“Much of our business is repeat buyers, people who may have bought from us 10 or 12 years ago and are ready to move up,” he states. “We're looking to offer them different features, new

things that weren't in the house we sold them before." Having a recognizable window brand name would have fit into that strategy, he explains.

Yet, Donley has instead chosen to use the Atria vinyl window with the wood interior. He was the first builder to install it in one of his homes, and currently plans to switch from Atria's clad wood line to the new line when it goes into full production this month. An important factor in the decision, of course, is the successful long-term relationship is firm his company has with Atria, but he cites a number of other reasons[12-16].

"Feature for feature, it's a better window," Donley states. He points, in particular, to the ease of cleaning offered by the tilt-in function the new line, which he can demonstrate easily to potential homebuyers. Compared to the competitively-priced, entry-level clad window, the unit's tilt function is much better, the builder states. Another feature he can point out to homebuyers is the interlocking rails of the two sash, something which is not found on the clad wood units.

As far as the brand name is concerned, Donley states there is certainly a value to it. In his area, he states, the larger tract builders, in particular, like to feature recognized name brand products in their homes, as they can add to the overall "perceived quality" of the home. That is true in his company's case too, but, he notes, as a smaller business, it generally has more one-to-one time with potential buyers. "We're able to talk to our customers and point out the quality features in the homes."

In talking to potential buyers, Donley notes, the subject of windows may come up, but he estimates only about three out of 10 customers ever ask any particular questions. The customer, he states, is "buying on our reputation, not on the reputation of any of the products we use."

The decision to go with the new Atria product is also based on his other needs as a builder. Demonstrating how much he can rack a clad-wood window sample in his office, Donley notes that there is nothing wrong with the window and it can perform quite well if it is installed properly. The fact that it can be put out-of-square so easily, he adds, however, presents a greater potential for improper installation. "We have good carpenters, but mistakes are made. That unit could go in slightly off, and create problems down the road," he states. "The welded vinyl frame is much sturdier. It's much easier to install and there's less need for fiddling around."

Gerhardt reports that in general, response from builder customers to the new line has been positive, and that several others are planning to start using it once it goes into full production. As a result, Atria is now planning to discontinue production of its original aluminum clad window in favor of the new line. Gerhardt, however, sees more potential for the product than his 60-firm company could ever meet. As a result, Atria has partnered with its long-time vinyl supplier, Veka, Inc., to offer the design to other window manufacturers also. With Atria licensing its patented design of attaching wood to the glazing bead, and Veka supplying extrusions and other technical support, the two companies have attracted interest from numerous companies about producing the line, he reports.

“It can put vinyl people in the wood window business without any problems,” Gerhardt asserts. From a production standpoint, he notes that the design is produced the same way a standard welded vinyl window is produced, with wood pieces cut to length in a separate operation, and then attached at the final assembly phase. The process is suitable for both standard size new construction products, like Atria manufactures, as well as custom sized units. As a result, Gerhardt sees a great deal of potential for vinyl replacement window manufacturers, because traditional clad wood windows are not often available in the custom sizes necessary in these types of applications[17-22].

At Atria, Gerhardt notes, the time it takes to produce the vinyl and wood windows is less than that for its aluminum-clad line. With larger, more automated manufacturers producing this type of window, he predicts they will be able to become even more cost competitive. The wood does not represent a major expense, he notes, as window manufacturers can find numerous suppliers to provide the wood profiles. His company uses poplar, which is popular in his company’s market. He expects other manufacturers will go with other wood species, and may refine the shapes of the wood profiles to create their own unique looks.

Builders keys to Success

Successful builders are those who can keep a steady stream of projects under construction. This allows for more predictability in the quality and availability of the needed labor. It also means that discounts can be obtained from suppliers who learn that they can count on a certain volume of business. Similarly, banks and lending institutions enjoy working with builders who are

predictable in making their payments. As a result they are more willing to extend credit when it is needed. And successful builders build delays into their plans and schedules. They don't know if sickness or the weather will cause the delays but for sure something almost always does. Those who do it well also manage the expectations of their customers. Setting unrealistic expectations for completion can result in some very unpleasant consequences for buyer and builder alike. Quality is another key to success that should not be overlooked. Those who do it right the first time don't have to take money out of their profits to make things right. Maybe, in the final analysis, the commercial builder must become the great communicator: needing to keep everyone up-to-date on the project status including, workers, sub-contractors, customers, banks, and building inspector[23-27].

The Differences and Similarities Between Builders and Contractors

In many instances, the words builder and contractor are taken to mean the same and are used interchangeably. Strictly speaking, though, a general builder is one who takes on the entire construction project and does everything himself. A general contractor, on the other hand, takes on the entire construction project but hires other people to do the work. In effect, the general contractor is more of a manager for the whole project. Some contractors do the major builder tasks for a project and just hire subcontractors for peripherals like aesthetic interior finishing and landscaping.

There are two kinds of contractors – the residential contractor and the commercial contractor. The residential contractor handles the construction of houses. The commercial contractor, on the other hand, handles construction projects for businesses. This covers office buildings, malls and shops[28-33].

Whether you decide to hire a builder or a contractor, make sure you hire only professionals. Sometimes, in an attempt to lower costs people hire non-professional builders or contractors who are little more than hobbyists. Only after problems crop up do they realize that they have caused themselves to incur even higher costs.

A professional builder or contractor has a reputation to protect in his field. He will, therefore, do everything in his abilities to render a professional job for every project, ensuring that

the customer is highly satisfied. Having chosen the profession, he can be counted on to take pride in delivering work well done.

A professional builder or contractor has the necessary training for any construction project. A good professional builder or contractor will also be undergoing continuous education through seminars and trade shows, keeping himself updated on current technologies and building techniques. This will ultimately benefit the client's project.

A professional builder or contractor also has more experience in various types of construction. Such experience is very valuable and complements training. It will provide the answers for practical problems that may crop up in the project. It also means more efficiency in the work and faster project completion.

Training and experience combined arms the professional builder or contractor with superior knowledge on all aspects of the construction project. He will know about all the regulations and requirements connected with your specific project and will guide you accordingly. You will not have to be penalized for construction, renovations or additional structures that do not adhere to established guidelines[34-37].

A professional builder or contractor will be concerned with safety. This means safety in the construction site for workers and the public, as well as safety of the finished structure. A professional builder or contractor will also be covered by all the necessary insurance. This means that the client's interests are covered, too.

A professional builder or contractor can provide further savings for you in cost of materials, too. He will know where to source the required materials at the best prices. He may also be given volume discounts by suppliers for whom he is a regular customer.

A professional contractor will also know how to subcontract only the best service providers for every phase of the project. After all, the contractor is only as good as his subcontractors' output.

A professional builder or contractor provides a sound contract before starting a project. This details all the components of the construction project, the materials to be used and the time line. It protects both the builder or contractor and the client.

A professional builder or contractor will also provide work warranties. This should cover not only deliverables for the turnover but also problems that may emerge much later on that can be traced to issues in construction[38-42].

1.1 Reason For Choosing The Topic

Reason is to analyse **Measuring Effectiveness Buyer Decision Towards Windows Market** is to gain knowledge about windows through builders. Observing builders opinion on windows market is helpful for my project and also development of the company. It is to find the opinion of builders and contractors, which is to do my analyses.

1.2 Objectives

- Primary:
 - To view about buyers attitude towards windows
- Secondary:
 - To study on buyers satisfaction towards window products.
 - To find current market price mix in window products.
 - To study about buyers awareness about window products.
 - To analyze different types of buyers behavior.

1.3 Need For The Study

- In this present **Scenario construction industries** plays vital role to improve people life style, so i planned to do my research on windows.
- From this research company should update current market trend of window products to healthy competition in market.
- From this research we must find and identify builders, need and views on windows product.

- To know the clients opinion about windows in the market and also for the company development.
- In this survey, competitive products and competitors in the market are to indentify and to do process for our business according to them.

1.4 LIMITATIONS

- It was very difficult for me to meet without appointment.
- I can't able to get data collections from builders without authorized reference.
- In field work of collecting data planned task or program are cannot be completed within specified or planned period.
- There is no good response or importance or respect in few places
- Many builders are asking why do I want to spend time with you? Why I need to give data information? what is the use for me in giving data?

1.5 RESEARCH METHODOLOGY

Research methodology is a way of systematically solving the research problem. In this, various types of techniques are generally adopted by a researcher in studying his research problem along with the logic behind the problem[43-45].

RESEARCH DESIGN:

Arrangements of conditions for collections and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

The study on Market Potential Towards Windows Product. Descriptive research includes surveys and fact-finding enquiries of different Kinds. The major purpose of descriptive research is description of the state of affairs, as it exists at present.

COLLECTION OF DATA:

There are several ways to collecting the appropriate data, which differ considerably with the type of research. There are two types of data are used in research process.

TYPES OF DATA:

Data is recorded, measure phenomena specified by the researchers. The research required both primary and secondary data.

1. Primary Data:

The data is collected by questionnaire. It is considered as heart of survey operation. A questionnaire is constructed and is given each worker for his/her response. The responses are collected from them and used for analysis. In this research the primary data was collected through survey using questionnaire.

2. Secondary Data:

Secondary data are collected from the books and the organization. Secondary data is an existing data, which may be already published. The secondary data to facilitate the study is collected from the various literatures, company magazines etc...

SAMPLING METHOD:

Multi-Stage sampling is adopted for this study.

METHOD OF COLLECTING DATA:

Personal interview method of survey technique is used in this research to collect primary data. It is considered as suitable method for collecting data.

1. Personal Interview:

Personal interview is extensively used in survey. It is face-to-face communication with the respondents to enable better control of samples.

2. Survey Method:

The survey method of obtaining information is based on the questioning of respondents. Respondents are asked various question regarding their behavior, intentions, attitudes, motivation, awareness and demographic and characteristics. These questions may be asked verbally in writing or via computer and the response may too be obtained in any of the ways. Usually the questions are structured[7-12], that is there is some standard or a pattern while questioning or collecting the data.

In structured data collection a questionnaire is prepared and the questions are prearranged and asked to the respondents. Thus making process is direct or indirect is based whether the

purpose or not. The difference between direct and indirect approach is explained before. The structured direct survey, the most popular data collection, involves administering a questionnaire. In a typical questionnaire most questions are fixed alternatives questions, which require the respondents to select from a pre determined sections of alternatives.

DEVELOPMENT OF THE QUESTIONNAIRE:

In the study of the research instrument is used in questionnaire.

Questionnaire:

The term questionnaire refers to a device for obtaining answers to questions by using a form, which respondents fill. A pilot survey has been conducted to modify the questions before going for the actual survey.

- Open Format Questions
- Closed Format Questions
- Rating Scale Questions

SAMPLE SIZE: (75)

Sample size refers to the number of elements to be included in the study. Determining the sample size is complex and involves several qualitative considerations.

Important qualitative factors in determining the sample size include:

- The importance of the decision.
- The nature of the research.
- The number of variables.
- The nature of analyses.
- Resources constraints.

In general, for more important decisions, more information is necessary and the information should be obtained more precisely. This calls for larger samples, but as the sample size increases, each unit of information is obtained at a greater cost. The larger the unit, the smaller the gain in precision by increasing the sample size by one unit[41-43].

The nature of research also had an impact on the sample size. My study being more of an exploratory research design type using qualitative research, a relatively small sample size is adequate when compared to conclusive research such as descriptive surveys.

Finally the sample size decision should be guided by a consideration of the resources constraints. In any research project, time and money are limited. The sample size required should be adjusted for the incidence of eligible respondents and completion date. The sample size consists of 75 respondents[19].

STATISTICAL TOOLS USED:

1. Percentage analyses:

Percentage refers to special kind of ratio. Percentages are used in making comparison between two or more series of data. It is used to describe relationship. Percentage can be used to compare the relative terms the distribution of two or more series of data. Since the percentage analysis reduce everything to common based and their by meaningful comparison.

$$\text{Percentage} = (\text{no of respondents} / \text{no of samples}) * 100$$

2. Chi square method:

A chi-square test is any statistical hypothesis test in which the sampling distribution of the test statistic is a chi-square distribution when the null hypothesis is true, or any in which this is asymptotically true, meaning that the sampling distribution (if the null hypothesis is true) can be made to approximate a chi-square distribution as closely as desired by making the sample size large enough.

$$\chi^2 = \sum \frac{(\text{Observed frequency} - \text{Expected frequency})^2}{\text{Expected frequency}}$$

<i>Particulars</i>	<i>uPVC</i>	<i>Aluminium</i>	<i>Wood</i>
Cost	13	59	9
Product aesthetics	29	12	43
Green credentials	35	36	11

5.4 TABLE- 4 Table showing that Satisfied Scale of Windows Factors

Total energy savings	36	14	29
Functional benefits	58	18	6
Service	36	34	8
Quality	41	11	29
Total	75	75	75

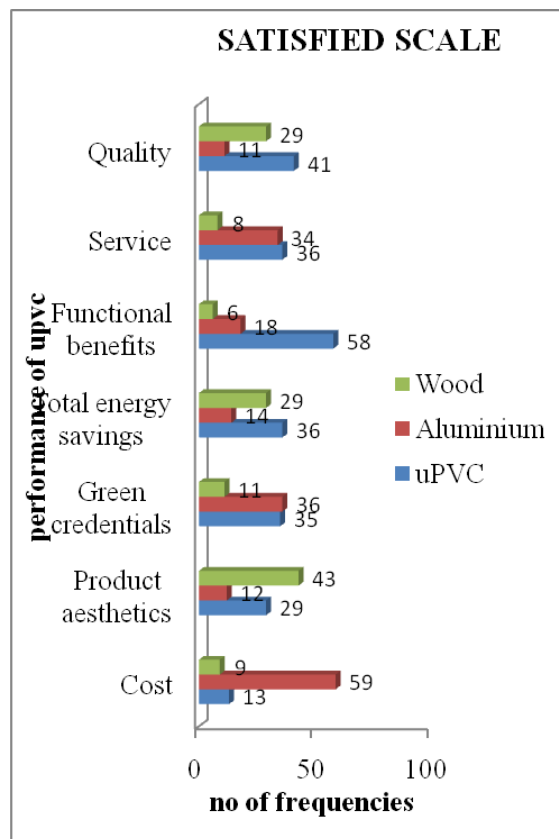
Inference:

The above table indicates that **Cost, Green Credential, and Service** are Satisfied on **Aluminium Window**.

The above table indicates that **Total Energy Savings, Functional Benefits, Service and Quality** are satisfied on **uPVC Window**.

The above table indicates that **Product Aesthetics** is only satisfied on **Wooden Window**.

5.4 CHART -4 Chart showing that Satisfied Scale of Windows Factors



5.5 TABLE-5 Table showing that Average of Windows Factors

Inference:

The above table indicates that **Cost, Product Aesthetics, Green Credential, Total Energy Savings** and **Service** are Average Factor on **uPVC Window**.

<i>Particulars</i>	<i>uPVC</i>	<i>Aluminium</i>	<i>Wood</i>
Cost	44	13	18
Product aesthetics	29	26	20
Green credentials	35	30	13
Total energy savings	30	30	25
Functional benefits	16	46	18
Service	34	30	13
Quality	27	37	15
Total	75	75	75

The above table indicates that **Total Energy Savings, Functional Benefits** and **Quality** are Average Factor on **Aluminium Window**.

5.6 TABLE-6

Table showing that Unsatisfied Scale of Windows Factors

Inference:

The above table indicates that **Cost, Green Credential, Functional Benefits, Service**

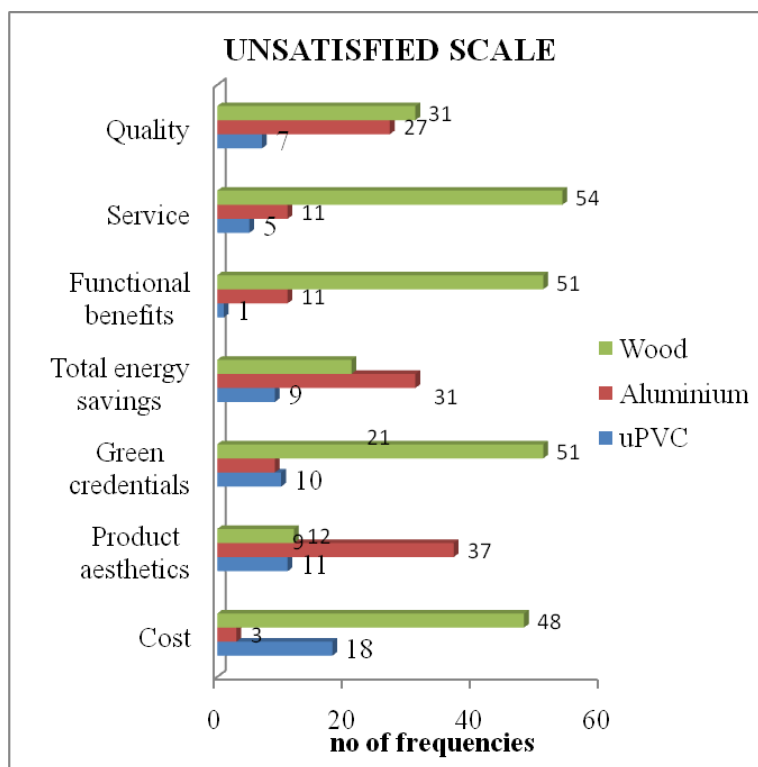
<i>Particulars</i>	<i>uPVC</i>	<i>Aluminium</i>	<i>Wood</i>
Cost	18	3	48
Product aesthetics	11	37	12
Green credentials	10	9	51
Total energy savings	9	31	21
Functional benefits	1	11	51
Service	5	11	54
Quality	7	27	31
Total	75	75	75

and **Quality** are Unsatisfied on **Wooden Window**.

The above table indicates that **Product Aesthetics** and **Total Energy Savings** are Unsatisfied on **Aluminium Window**.

5.6 CHART-6 Chart showing that Unsatisfied Scale of Windows Factors

Current Projects Upvc windows	Luxury flats	Premium Flats	Budget Flats	Commercial Flats	Total



Chi- Square test Relationship between current projects and upvc windows

Yes	18	17	30	23	88
No	9	11	22	8	50
Total	27	28	52	31	138

Calculation of table value:

Tabulated Value at 5% level of significance.

Degree of freedom = (r-1) (c-1)

$$=(2-1) (4-1)$$

$$=1*3$$

$$=3$$

Degree of freedom = 7.815

O	E	O-E	(O-E)²	(O-E)²/E
18	17	1	1	0.06
17	18	-1	1	0.06
30	33	-3	9	0.27
23	20	3	9	0.45
9	10	-1	1	0.10
11	10	1	1	0.10
22	19	3	9	0.47
8	11	-3	9	0.82
Total				2.33

$$X^2 = \sum [(O-E)^2/E] = 2.33$$

Tabulated = 7.815

Inference:

The calculated value of X^2 is lesser than the value H_0 is accepted at 5% level of significance.

Hence there is significance between lesser current projects and using upvc windows.

Relationship between types of windows used in your projects and window is preferred to buy.

Used in your projects Prefered to buy	Wood	Aluminium	uPVC	Total
Customized Window	41	28	29	98
Standardized Window	16	17	11	44
Total	57	45	40	142

Calculation of table value:

Tabulated Value at 5% level of significance.

$$\begin{aligned}
 \text{Degree of freedom} &= (r-1)(c-1) \\
 &= (2-1)(3-1) \\
 &= 1 \times 2 \\
 &= 2
 \end{aligned}$$

Degree of freedom = 5.99

O	E	O-E	$(O-E)^2$	$(O-E)^2/E$
41	39	-2	4	0.10
28	31	3	9	0.29
29	28	-1	1	0.04
16	18	2	4	0.22
17	14	-3	9	0.64
11	12	1	1	0.08
Total				1.37

$$X^2 = \sum [(O-E)^2/E] = 1.37$$

Tabulated = 5.991

Inference:

The calculated value of X^2 is lesser than the value H_0 is accepted at 5% level of significance.

Hence there is significance between lesser types of windows used in your projects and window is preferred to buy.

6 FINDINGS

MARKET PRICE MIX:

- Out of 75 builders, 59 builders are **Satisfied** with the **market price** in **Aluminium Windows**.
- Out of 75 builders, 44 builders are **Average Satisfied** with the **market price** in **uPVC Windows**.
- Out of 75 builders, 48 builders are **Unsatisfied** with the **market price** in **Wooden Windows**.
- 39, 08 and 03 of the builder's perceived **price** is one of the **Good factors** in **Aluminium, uPVC and Wooden Windows** respectively.
- 32 and 30 respondents are floating **Aluminium** window market price range of **Below Rs.250** and between **Rs.250 to Rs.350** respectively.
- 22 and 31 respondents are floating **uPVC** window market price range of **Between Rs.250 to Rs.350** and between **Rs.350 to Rs.500** respectively.
- 19 and 39 respondents are floating **Wood** window market price range of **Between Rs.350 to Rs.500** and above **Rs.500** respectively.

BUYERS AWARENESS:

- ✓ Out of 75 builders, 39 of them perceived that **Aluminium** is the **Fast Moving** window in the market.
- ✓ Out of 75 builders, 26 of them perceived that **uPVC** is the **Moderate Moving** window in the market.
- ✓ Out of 75 builders, 10 of them perceived that **Wood** is the **Slow Moving** window in the market.

- **31.82%** and **25%** of builders are mainly using **uPVC** windows for its **Current Trend** and **Aesthetics** respectively.
- **29%** of builders are mainly not using **uPVC** windows for its **Price**.
- ✓ Out of **75** builders, **35** of them preferring **Customized Window** for their Projects.
- ✓ **66 & 32 respondents of builders using Openable window and Sliding Window for their Projects respectively.**
- ✓ **19** and **16** respondents have perception on **Termite Resistance** and **Sound Insulation** are Good Factor in **uPVC** window.
- ✓ **39** respondents have perception on **Cost** which is one of the Good Factor in **Aluminium** window.
- ✓ **26, 17** and **16** respondents have perception on **Strength, Life of the Product** and **Aesthetics** which are some of the Good Factors in **Wood** window respectively.

BUYERS SATISFACTION:

- Out of **75** builders, **59** builders are satisfied in using **aluminium window** for its **cost**.
- Out of **75** builders, **43** builders are satisfied in using wood **window** for its **product aesthetics**.
- Out of **75** builders, **36** and **35** builders are satisfied in using **aluminium** and **UPVC windows** for its **green credentials respectively**.
- Out of **75** builders, **36** builders are satisfied in using **UPVC window** for its **total energy savings**.
- Out of **75** builders, **58** builders are satisfied in using **UPVC window for its functional benefits**.
- Out of **75** builders, **36** builders are satisfied in using **UPVC window for its services**.
- Out of **75** builders, **41** builders are satisfied in using **UPVC window for its quality**.
- In overview **35.42%** of **maximum** builders are satisfied for using **UPVC windows for their good factors**.

TYPES OF BUYERS BEHAVIOUR:

- **50%** and **49%** of builders are using **wooden windows** for their **budget projects** and **luxury projects** respectively.
- **51%** of builders are using **upvc windows** for their **premium projects**.
- **60%** of builders are using **Aluminim windows** for their **commercial projects**.

- In overview **35.75%** of maximum builders are using **upvc windows** for their projects.

6.1 SUGGESTION

- ❖ Maximum builder's switchover to customized window for their projects. Some of the clients giving measurement based on Vasthu Sasthram so the company wants to concentrate on Customized window.
- ❖ In budget flats they mainly concentrate on lifetime and cost, so the company wants to approach their customers by highlighting the best cost.
- ❖ Builders are unsatisfied of aluminium windows in safety, aesthetics and total energy savings, so if we plan and develop some ideas in these area will create good market.
- ❖ If we start wooden window business mainly it has to maintain functional benefits and services and also make insulation facilities to make easy.
- ❖ If we have plan to start upvc window, just have concentration on price of window, customers are ready to buy when there is decrease in upvc windows.
 - Improve services for upvc window
 - Increase upvc availability in window market.
 - Maintain a good quality.
 - Create current trend.
- ❖ When we plan for wood or upvc window mainly see to aluminium window market
- ❖ Aluminium windows are moving fast in market, so use the policies and marketing strategy of aluminium windows in upvc or wood to develop their business.
- ❖ Maximum of builders and clients are like to have openable and sliding design windows.
- ❖ Many builders are expecting some of the important factors like
 - Cost
 - Sound proof
 - Termite resistance
 - Strength
 - Aesthetics
 - Life of the product and etc.. have consideration at the time of production.

6.2 CONCLUSION

The project has done on a windows market that would be useful for the construction company, it is important that we reap a constructive conclusion from the information collected through builders and contractors. Price is the most important factor that highlighted in the current window market.

After analyzing the windows market from the respondents I concluded that we can boldly start the window business in Chennai, main reason because of increasing in population, there is need for both residential and commercial flats. So many buildings are under construction process and many projects planning are going on. So all these surely creates demand for windows

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