CONSUMER ACCEPTANCE OF AIR PURIFIER IN CHINA
Yanxi Guo

Abstract

This article is studying the consumer acceptance of air purifier product. Nowadays, because of the progress of industry, life of atmosphere contains a lot of pollutants and impurities. Most of them have a negative effect on almost all systems of human body and on human health in generally. Besides outdoor pollutants indoor air has its own pollutants. 90% of the life people spend in premises breathing indoor air. The Global Air Purifier Market has witnessed growth in the last few years and is expected to grow further at a CAGR of 8 percent. However the different personal background of consumers and different satisfaction with their indoor air quality can affect consumers different acceptance of air purifier. The importance of this study is research consumers different mix factors influence consumers satisfaction with air purifier product then analys the current consumers acceptance of air purifier. This study can be consider the initial investment of air purifier product. The emergence of Air Purifier Market in China was noticed around 2008 when global major players started targeting China. Although the market is still in its nascent stage but is expected to grow at a CAGR of 36 percent till 2016. It will indicates that Chinese air purifier market has been grow up rapidly.

Most Chinese consumers satisfied with air purifier products, which showed the satisfaction with air purifier product quality and price got the all high mean 3.99 and 4.14. The consumers different demographic personal background can affect consumers acceptance of air purifier, especially the different gender; age; monthly income; occupation are important factors by the significant are 0.036; 0.001; 0.028; 0.001, there are all less than the significant standard level 0.05. This study shows that consumers who need or don’t need special pollution protection (such as pregnant women; Infants and children; old people; patient ect.) whether affect consumers attitude toward air purifier and consumers acceptance and used by T-test and F-test got the significant result is 0.5384 which is higher than 0.05, therefore this factor just has little bit influence consumers acceptance and reject the hypothesis. For this study we can know that Chinese consumers satisfaction with their indoor air quality also is the factor to influence their attitude toward air purifier and affect consumers acceptance. Even Chinese air purifier market has potential and investors interested, but the market positioning and investment strategies also need market research and analysis. This study of consumers satisfaction with air purifier and analysis the marketing mix of air purifier to gain an in-depth understanding of air purifier market in China. To help industry consultants, air purifier manufactures and other stakeholders to align their market-centric strategies. Let's forecast that Chinese air purifier market have a great market space under the support of Chinese government and global trend of air environment.

Keyword: consumer acceptance; consumer satisfaction; air purifier market;
Introduction

Concerned about the Investment Trends. Air pollution is the biggest global world problem today. The problem arose during the industrial revolution and has just gotten worse since then. Many different sources cause air pollution. Automobiles that are burning gasoline produce very harmful gases and incineration of products. Factories produce millions of particles that are carried off into the air. Gaseous by-products produced by chemical plants release these toxic gases when their concentration is at a high enough level. However, the industrial revolution brought many great changes to the world; better transportation, cheaper merchandise, and has made our life better. In the beginning of the industrial revolution, the problem of pollution was not something that people paid attention too. As the science involved, people began to realize the problem with pollution. As the world has become more industrialized, the increased amount of air pollution Air pollution can arise from different sources that we cannot control. The health hazards have developed, especially in urban areas. Air pollution is a significant risk factor for multiple health conditions including respiratory infections, heart disease, and lung cancer, according to the WHO. The health effects caused by air pollution may include difficulty in breathing, wheezing, coughing, asthma and aggravation of existing respiratory and cardiac conditions. These effects can result in increased medication use, increased doctor or emergency room visits, more hospital admissions and premature death. The human health effects of poor air quality are far reaching, but principally affect the body's respiratory system and the cardiovascular system. All of the governments of the world’s nations are taking different measures to solve this problem. The Clean Air Act has been passed in many countries, which has reduced the air pollution.

China is known as the world’s engine for manufacturing where almost every kind of product starting from heavy engineering to a small needle is manufactured. With these capabilities Chinese economy has certainly flourished over the years but has also resulted in some long term negative effects. One such effect has been increasing air pollution which has increased the number of patients suffering from air borne diseases, these developments has raised alarms among Chinese authorities which has started spreading awareness about harmful effects of air pollution and how to control it. One of the best known solutions for air pollution control is the emergence of air purifiers in Chinese households. The increasing transportation and industrialization activities are resulting in degradation of air quality. The increasing air pollution and the need to combat its ill effects are significantly contributing to the demand for air purifiers in China.

Beijing is the capital of the People's Republic of China and one of the most populous cities in the world. The population as of 2012 was 20,693,000. The metropolis, located in northern China, is governed as a direct-controlled municipality under the national government, with 14 urban and suburban districts and two rural counties. Air pollution in China, especially in the capital city of Beijing, has become an ever-increasing issue among residents and environmentalists both in China and abroad.
Objectives

The objective of this study is to explore the consumer attitude and satisfaction toward air purifier product influence consumer acceptance of air purifier product currently. Create some suggestion for investors recognize the market potential and prepare investment.

- The study of consumer awareness level of air purification products currently.
- Analysis the independent variables which have influence in the customer decision.
- The study of customer satisfaction of product.
- Analysis the factors of consumer accept to buy air purifier product.

Hypothesis

H1: The people indifferent demographic background have different attitudes towards air purifier products.
H2: The people different satisfaction with their indoor air quality have different attitudes toward air purifier product.
H3: People whom have or no have special protection people can affect people attitudes toward air purifier product.

Conceptual Framework

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variables</th>
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<tbody>
<tr>
<td>Personal factors</td>
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<tr>
<td>- Gender</td>
<td>- The packaging of air purifier product as followed the different understandings of individual consumers, as well as various uncertainty factors caused by consumer different attitudes and behavior.</td>
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<tr>
<td>- Age</td>
<td>- The product quality of current air purifier</td>
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<td>- Education</td>
<td>- The price of air purifier</td>
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<td>- Income</td>
<td>- The services of air purifier</td>
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<td>- Occupation</td>
<td>- The promotion of air purifier</td>
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<tr>
<td>- Marital status</td>
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<tr>
<td>Socio-Life factors</td>
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<tr>
<td>- Situation of family members</td>
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<td>- Life environment situation</td>
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Theory And Related Research

- Theories of consumer

In economics, utility is a representation of preferences over some set of goods and services. Preferences have a (continuous) utility representation so long as they are transitive, complete, and continuous. Utility is usually applied by economists in such constructs as the indifference curve, which plot the combination of commodities that an individual or a society would accept to maintain a given level of satisfaction.

Consumer preferences are defined as the subjective (individual) tastes, as measured by utility, of various bundles of goods. They permit the consumer to rank these bundles of goods according to the levels of utility they give the consumer. Note that preferences are independent of income and prices.

- Theories of understanding consumer attitudes

An attitude in marketing terms is defined as a general evaluation of a product or service formed over time (Solomon, 2008). An attitude satisfies a personal motive—and at the same time, affects the shopping and buying habits of consumers. Dr. Lars Perner (2010) defines consumer attitude simply as a composite of a consumer’s beliefs, feelings, and behavioral intentions toward some object within the context of marketing. A consumer can hold negative or positive beliefs or feelings toward a product or service. A behavioral intention is defined by the consumer’s belief or feeling with respect to the product or service.

- Theory of consumer acceptance

TAM (technology acceptance model) is one the famous models in consumer acceptance that was studied by Davis in 1989. Actually, consumers may adopt high-technology products not only to obtain useful benefits but also to enjoy the experience of using them (Kulviwat, Bruner II et al. 2007). The goal of TAM is to offer a parsimonious explanation of the determinants of adoption that would be general enough for application to usage behavior across a wide range of technology innovations (Davis, Bagozzi et al. 1989). TAM concentrates on two key perceptions which are ease of use and usefulness. Perceived usefulness is the degree to which a potential consumer believes the use of a specific instrument or tool will improve his/her performance, and perceived ease of use is the perception that using a specific technology will not require additional work and energy.

- Marketing

The market environment is a marketing term and refers to factors and forces that affect a firm’s ability to build and maintain successful relationships with customers. Three levels of the environment are: Micro (internal) environment - small forces within the company that affect its ability to serve its customers. Meso environment – the industry in which a company operates and the industry’s market(s). Macro (national) environment - larger societal forces that affect the microenvironment.
- **Consumer decision making**

  This theory in economics, psychology, philosophy, mathematics, and statistics is concerned with identifying the values, uncertainties and other issues relevant in a given decision, its rationality, and the resulting optimal decision. It is closely related to the field of game theory as to interactions of agents with at least partially conflicting interests whose decisions affect each other. [Anand, Paul (1993). Foundations of Rational Choice Under Risk. Oxford: Oxford University Press. ISBN 0-19-823303-5.]

**Methods**

The study is based upon both primary and secondary sources. The primary research included research with air purifier consumers by questionnaire through internet website. The secondary research included an exhaustive search of relevant publications, like newspapers, company annual reports and proprietary databases.

Researcher has selected survey methodology by operating under procedures as follows:

- Determining population and sample: the population of this study is Chinese people, special with citizen in Beijing city. Total of population is 20,693,000 persons. The sample size of this study was calculated by using Taro Yamane (Yamane, 1973) formula with 95% confidence level, got the sample size is 400 persons.

- Research instrument: the questionnaire is used as the research instrument. The questionnaire consists of 4 parts with using the open-ended questions, check-list question, five point Likert scale and fill-in form questions for each part.

- Formulating research instrument: the questionnaire is formulated through 4 steps: Understanding conceptual framework of study - Brain storming for questions that will be used in the questionnaire - Classified problems - Selecting the relevant questions and sequencing the questions in order - Test the reliability of the questionnaire.

- Data collection: questionnaires were distributed to sample group start on August 2013. The completed questionnaire will be processed for coding and analyzing through SPSS.

- Data analysis and the statistics used in data analysis: the data of this study will be analyzed by computer through package software (SPSS: Statisfical Package For Social Sciences) as follows:

  1> The demographic background information of the respondents and the consumers’ life environment status will be analyzed and presented using descriptive statistics in form of Frequency and Percentage.

  2> The information of different consumers satisfaction with air purifer products will be ranged and presented using descriptive statistics in form of Mean and Standard Deviation (SD).

  3> The hypothesis testing used compare with Mean and Statistic by T-test or F-test.
Results

【PART ONE】: The result of collection of personal background information and people life environment status.

- Gender
Male respondents get the majority with 229 persons in the percentage of 57.3% while female only 171 persons in 42.7%.

- Age
The age between 16 and 25 is the majority, which are 129 person or 32.3% of the total respondents. And the last group is age above 55, which has only 30 people by 6.5% of the total respondents participated in the survey.

- Education Background
Bachelor group is the majority of education background which reach 122 persons with 30.5%.

- Monthly Income
Group 2000~5000 RMB is the majority accounting for 117 persons or 29.3%.

- Occupation
Student group is the majority, are 92 persons or 23%.

- Marital status
The Unmarried and Married are in the same percentage, 50% for each one.

Figure 1: the frequency and percentage of people needing air pollution protection.

1: 129 pregnant women or 67.3%.
2: 137 infant and children or 34.3%.
3: 119 old people or 29.8%.
4: 22 sick persons or 22%.
5: 46 other persons or 11.5%.

Figure 2: the frequency and percentage of people having special protection.

Smokers: 185 persons or 46.8%.
Friends or family smoking: 239 persons or 59.3%.
Have pets: 289 persons or 47.3%.
【PAET TWO】: The result of consumers satisfaction with air purifier product currently.

The product packaging of air purifier: product box packaging is the most satisfied packaging with the mean score of 4.14. The least satisfied packaging is product size with the mean score of 3.92. The consumers consider the product packaging of air purifier is high with the mean of 4.02. While they have a highest degree of satisfaction.

The product quality of air purifier: consumers have a high satisfaction with the product quality in the mean of 3.99, while the quality of odor removal has the highest degree of satisfaction with the mean of 4.12, and the air purifier more effective than other measures for air cleaner has the lowest degree of satisfaction which has mean score of 3.93.

The product price of air purifier: consumers have a high satisfaction with the price of air purifier product with the mean of 4.14, while the product price itself has the highest degree of satisfaction with the mean of 4.19, and the price compare with other air cleaning services is also high degree of satisfaction, but the mean is lower than product price itself which has mean score of 4.08.

The product services of air purifier: consumer has high satisfaction with sales person service in the mean of 3.80, and consumer has high satisfaction with after sale services in the mean of 3.65. So consumer has high satisfaction with air purifier product services in the total of mean is 3.73.

The product promotion of air purifier: the salesperson promotion is the most preferable promotion measure with the mean score of 3.98. The least promotion measure is Television advertising and other media with the mean score of 3.84. Even the mean of each measure is high, but consumer were still strongly dissatisfied with product promotion.

【PART THREE】: Hypothesis Testing

The hypothesis testing for this study, used T-test or F-test to calculate the significant. The test involves comparing the observed values with theorized values. The tests establish whether there is a relationship between the variables, or whether pure chance could produce the observed results. For this study we compared by the significant level 0.05. The significant result less than 0.05 means the result of hypothesis testing is “Accept”; if the significant result more than 0.05 means “Reject”.

Table 1: The Summarization Result Of The Hypothesis Testing

<table>
<thead>
<tr>
<th>The Research Hypothesis</th>
<th>Statistic Method</th>
<th>Sig.</th>
<th>The Result of Research Hypothesis Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>T-test</td>
<td>0.036</td>
<td>Accept H1</td>
</tr>
<tr>
<td>Age</td>
<td>F-test</td>
<td>0.001</td>
<td>Accept H1</td>
</tr>
<tr>
<td>Educational Background</td>
<td>F-test</td>
<td>0.110</td>
<td>Reject H1</td>
</tr>
<tr>
<td>Monthly Income</td>
<td>F-test</td>
<td>0.028</td>
<td>Accept H1</td>
</tr>
<tr>
<td>Occupation</td>
<td>F-test</td>
<td>0.001</td>
<td>Accept H1</td>
</tr>
<tr>
<td>Marital Status</td>
<td>T-test</td>
<td>0.263</td>
<td>Reject H1</td>
</tr>
</tbody>
</table>
Satisfaction with indoor air quality

<table>
<thead>
<tr>
<th>People who need or don’t need special protection</th>
<th>F-test 0.002</th>
<th>Accept H2</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-test 0.5384</td>
<td>Reject H3</td>
<td></td>
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</tbody>
</table>

The table 1 shows that:

**For Hypothesis 1:** The people with indifferent demographic background have different attitudes towards air purifier products.

- Gender: Used the T-test with the significant is 0.036. The significant is less than 0.05, therefore there is a difference attitude of air purifier between gender, the H1 test is “Accept “.
- Age: The significant is 0.001 which is less than 0.055, therefore there is a difference attitudes of air purifier between age, and H1 test is “Accept “.
- Educational background: The significant is 0.110 which is more than 0.05, therefore there is no difference attitudes of air purifier between educational background, and H1 test is “Reject “.
- Monthly Income: The significant is 0.028 which is less than 0.05, therefore there is a difference attitudes of air purifier between monthly income, and H1 test is “Accept “.
- Occupation: The significant is 0.001 which is less than 0.05, therefore there is a difference attitudes of air purifier between occupation, and H1 is “Accept “.
- Marital Status: The significant is 0.263 which is more than 0.05, therefore there is no difference attitudes of air purifier between marital status, and H1 is “Reject “.

**For Hypothesis 2:** The people different satisfaction with their indoor air quality have different attitudes toward air purifier product.

The table 1 shows that the significant of satisfaction with indoor air quality is 0.002 which is less than the significant level 0.05, therefore there is a difference attitudes, consumers different satisfaction can influence their attitude toward air purifier product. H2 is “Accept “.

**For Hypothesis 3:** People who need and don’t need special protection can affect people attitudes toward air purifier product.

The table 1 shows that the significant of need or don’t need special protection is 0.538 which is higher than the significant standard level 0.05, therefore there is no different attitude, and the consumers whether needing special protection or not don’t affect the consumers attitude toward air purifier. The result “Reject ” H3.
Conclusions

The research studies the consumers acceptance of air purifier product in China, the study result can be concluded as follows:

Consumers with different personal background can affect consumers acceptance of air purifier, which the gender; age; monthly income; occupation are the important factors. The hypothesis testing used by statistic method both T-test and F-test, analysis the significant for gender; age; monthly income; occupation are 0.036; 0.001; 0.028; 0.001, there are all less than the significant standard level 0.05. These factors can influence consumers attitudes toward air purifier and acceptance. But the factors of consumers educational background and marital status sometime have no influence (such as the significant of product price by educational background is 0.189 and by marital status is 0.450 ) the level of significant exceeds the standard. So the hypothesis testing not all accept the H1.

Consumers have the high satisfaction with air purifier products in the mean of 3.49955. The factor of consumers satisfaction with their indoor air quality is also the important factor to affect consumers attitudes toward air purifier product. The use of F-test got the significant result of 0.002 which is less than significant standard level 0.05, so the H2 “Accept” for this study.

But For Hypothesis 3 the factor of consumers who need or don’t need special pollution protection (such as pregnant women; Infants and children; old people; patient ect.) has little affect the consumers acceptances. The significant is 0.5384 which is higher than the significant standard level 0.05, therefore consumers whether have special protection people is not a important factor to affect consumers attitude toward air purifier and consumers acceptance.

Recommendation

1. This study can be considered the initial investment of air purifier.

2. To help industry consultants, air purifier manufacturers and other stakeholders to align their market-centric strategies.

3. To gain an in-depth understanding of air purifiers market in China.

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