

Use Innovativeness for New Product Development: A Study on Users of Titan Watches

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ABSTRACT

Developing a new product requires understanding of consumers, conducting ethnography research, empathizing with the customers, finding their needs, looking at pain points. But more importantly, it is the adoption of the product by the consumer at the end of the day which matters. Estimating the product usage and his need satisfaction level is what helps the product to penetrate in market. Use innovativeness involves the use of previously adopted products in novel ways. As conceptualized by Price and Ridgway use innovativeness encompasses five factors: creativity/curiosity, risk preferences, voluntary simplicity, creative re-use and multiple use potential. Use innovativeness is measured by above scales and a conceptual model of post adoption process is developed. Understanding, the technology adaption life cycle by grouping consumers into Innovators, Early Adaptors, Early Majority, Late majority and Laggards, helps us strike a fine relation between product developed according to its use innovativeness and the stage of technology adoption cycle your product will mostly fall under. The conceptual model is then clubbed with framework for technology adaption cycle which will be useful for companies mainly product based, to understand its target consumers and the target market in hitting with highest probability of success. Companies looking at pivoting a product when the product doesn't work in the market, is a painful task. Killing a product and it's usage involves lot of time, effort and money. Developing a product understanding one's target consumers and looking at their probable adoption is a difficult relation to strike. The Study and Analysis developed here after research of consumers and their use innovativeness in target segment helps us to put the product in right market, at right time and with right adoption purpose based on user innovativeness and will have a future scope of arriving at a framework that can help companies to launch a new product.

Keywords-- Ethnography, Use Innovativeness, Pivoting, Technology Adoption Cycle, Post Adoption Process, Empathy

I. INTRODUCTION

There has been considerable interest in developing products that are innovative and creative to use. It has

become a subject of interest in recent times to understand consumer behavior perspectives that are explorative and variety seeking. Use innovativeness is one of the major kind of exploratory consumer behavior. There are two other kinds of consumer exploratory behavior which include exploratory purchase behavior and vicarious exploratory behavior. Exploratory purchase behavior, is variety seeking that involves product purchase and manifests itself in two ways: innovating and brand switching. The second type of exploratory behavior is vicarious exploratory behavior where consumers talk about engaging in behaviors such as reading about, talking to others about, or shopping for new or unfamiliar products.

In contrast to vicarious and exploratory purchase behavior, use innovativeness is a product consumption behavior. We are trying to explore levels of use innovativeness that is exhibited by any user. Understanding, the technology adaption life cycle by grouping consumers into Innovators, Early Adaptors, Early Majority, Late majority and Laggards, helps us strike a fine relation between product developed according to its use innovativeness and the stage of technology adoption cycle your product will mostly fall under. The conceptual model is then clubbed with framework for technology adaption cycle which will be useful for companies mainly product based, to understand its target consumers and the target market in hitting with highest probability of success. The major part of this research talks about how factors like expenditure, age of sample, activity in society/community, opinion leadership of users will determine the stage of adopting a product and how they are correlated to the factors of use innovativeness.

We have chosen Titan as company and their branded watches as product, to study the correlation for the adoption of new product with factors of user innovativeness.

II. METHODS & METHODOLOGIES

This research uses survey method and is conducted by using questionnaire as a tool for collecting data. Selection of users is done by purposive sampling technique, namely users who have used/using Titan watches. The

research population is of all age groups and all occupations. Users sampling was done by using simple random sampling technique.

Research instrument used is of questionnaire format. The questionnaire is to measure, the users of Titan watch products for whom 15 questions (obtained after performing a validity test by cancelling out from 20 questions) having likert scale with option from 1 to 10 on agreement or disagreement with the statement, provided to

the users about behaviors during use innovativeness of a watch or a product in general.

Pearson product-moment is used to do the correlation instrument validity test. Validity for meeting the criteria is value of $r_{calculation} > r_{table}$ at the significance level of alpha equal to 0.05. The reliability test is conducted by Alpha Cronbach coefficient formula. If the Alpha Cronbach value is >0.60 , the measurement of observed variables is highly reliable and we could ahead with the results to be measured.

Table 1: Results of instrument validity and reliability

Instrument	$ r_{calc} $	r_{table}	$r_{calc} > r_{table}$ (Validity)	Reliability	Note
Curiosity to know how products work with Age	0.8613	0.138	Valid	0.7419	Reliable
Re-usability interest with Age	0.8052	0.138	Valid	0.6485	Reliable
Interest of packaging with Age	0.1	0.138	Invalid	0.01	No reliability
Spending potential with using a product in many different ways	0.779	0.138	Valid	0.6073	Reliable
Opinion leaders opinion about multiple-use potential of a Titan watch	0.6339	0.138	Valid	0.4019	Reliable
High opinion leaders opinion about reusability of Titan watch	0.4817	0.138	Valid	0.2321	Reliable
High opinion leaders opinion about packaging importance	0.4659	0.138	Valid	0.2171	Reliable
Low opinion leaders fear for buying a new product in market	0.5599	0.138	Valid	0.3135	Reliable
Users skeptical about new product analyzed for fear of using a product that is unknown	0.7819	0.138	Valid	0.3739	Reliable
Spending potential with willingness to buy from second hand store	0.3923	0.138	Valid	0.1539	Reliable

Three stages are carried out in the research. The first stage includes preparation of questionnaire to measure the variables expenditure, age of sample, activity in society/community, opinion leadership of users will determine the stage of adopting a product and how they are

correlated to the factors of use innovativeness. The second stage is the reliability and validity test of the instrument designed. Implementation of test questionnaire to users of Titan is the third stage. From the result data of creativity/curiosity, risk preferences, voluntary simplicity,

creative re-use and multiple use potential scales obtained with relation to technology adoption factors, a normality test has been carried out. The normality test is used to test two hypotheses, they are

H₀: samples are not from normal distribution

H₁: samples are from normal distribution.

Criteria is samples follow normal distribution.

Bartlett method with chi square analysis technique is used for homogeneous testing, hypothesis include

H₀: samples are from non-homogeneous population,

H₁: samples are from homogeneous population.

If the sample from normal distribution population is ($L_{\text{calculation}} < L_{\text{table}}$) and homogeneous ($\chi^2_{\text{calculation}} < \chi^2_{\text{table}}$), it can be continued with hypothesis analysis. A multiple correlational analysis is used to know the relation between dependent and independent variables. Results of multiple correlational analysis are tested to see if correlation is linear or non-linear. Significance testing for hypothesis is done according to the value of regression coefficient after which the regression equation is obtained. ANOVA significance testing for regression equation is then carried out. The significant criteria of regression equation is if $F_{\text{calculation}} > F_{\text{table}}$ for $\alpha = 0.05$ the regression equation is significant, it is not significant if it is vice-versa.

III. RESULTS AND ANALYSIS

3.1. The Instrument Reliability and validity Analysis Results

Independent and Dependent Table 1 results of variables reliability and validity analysis results show that the problem questions prepared in questionnaire for this research are valid and reliable, for the questionnaire of Curiosity to know how products work with Age, Re-usability interest with Age, Interest of packaging with Age, Spending potential with using a product in many different ways, Opinion leaders opinion about multiple-use potential of a Titan watch, High opinion leaders opinion about reusability of Titan watch, High opinion leaders opinion about packaging importance, Low opinion leaders fear for buying a new product in market, Users skeptical about new product analyzed for fear of using a product that is unknown, Spending potential with willingness to buy from second hand store are valid relations.

3.2. Results for Normality and Homogeneity Analysis

The multiple correlation analysis can be conducted to know the relation between independent and dependent variables because the test for normality and homogeneity tests show positive as per Table 2.

3.3. The Multiple Correlation Analysis Results of Independent and Dependent Variables

A multiple correlation analysis is performed on independent variables like Age(X1), Spending potential(X2), Opinion leadership(X3), Low opinion leadership(X4) collectively with the Curiosity to know how products work(Y1), Re-usability interest(Y2), Interest of packaging(Y3), multiple-use potential(Y4), packaging importance(Y5), willingness to buy from second hand store(Y6), fear of using a product that is unknown(Y7) are shown in Table 3. The multiple correlation study was done on x1-y1, x1-y2, x1-y3, x2-y4, x3-y4, x3-y2, x3-y5, x4-y7, x2-y6 to test the null hypothesis (H₀) which states that there is no relation between Age(X1), Spending potential(X2), Opinion leadership(X3), Low opinion leadership(X4) collectively with the Curiosity to know how products work(Y1), Re-usability interest(Y2), Interest of packaging(Y3), multiple-use potential(Y4), packaging importance(Y5), willingness to buy from second hand store(Y6), fear of using a product that is unknown(Y7); The alternative hypothesis (H₁) states that there is relation between Age(X1), Spending potential(X2), Opinion leadership(X3), Low opinion leadership(X4) collectively with the Curiosity to know how products work(Y1), Re-usability interest(Y2), Interest of packaging(Y3), multiple-use potential(Y4), packaging importance(Y5), willingness to buy from second hand store(Y6), fear of using a product that is unknown(Y7), H₀ is accepted when r calculation is lesser than r table, and H₁ is rejected, whereas, if r calculation is bigger than r table ($r_{\text{calculation}} > r_{\text{table}}$) H₁ is accepted and H₀ is rejected. In Table 3, it is shown that the variables of Age(X1), Spending potential(X2), Opinion leadership(X3), Low opinion leadership(X4) collectively (X1,X2,X3,X4) show significant relation with the Curiosity to know how products work(Y1), Re-usability interest(Y2), Interest of packaging(Y3), multiple-use potential(Y4), packaging importance(Y5), willingness to buy from second hand store(Y6), fear of using a product that is unknown(Y7). With the values of r calculation 0.8613(negatively correlated), r calculation 0.8052 (positively correlated), r calculation 0.1(no correlation), r calculation 0.779(negatively correlated), r calculation 0.6339(positively correlated), r calculation 0.4817(positively correlated), r calculation 0.4659 (positively correlated), r calculation 0.5599 (negatively correlated), r calculation 0.7819 (positively correlated), r calculation 0.3923(negatively correlated) respectively of x1-y1, x1-y2, x1-y3, x2-y4, x3-y4, x3-y2, x3-y5, x4-y7, x2-y6. These results cause the rejection of null hypothesis and acceptance of the H₁ stating that there is relation between Age(x1) and Curiosity to know how products work(Y1), Age(x1) and Re-usability interest(Y2), Age(x1) and Interest of packaging (Y3), Spending potential(x2) and multiple-use potential(Y4), Opinion leadership(x3) and multiple-use potential(Y4), Opinion leadership(x3) and Re-usability interest(Y2).

Figure 1. Curiosity level to understand how a product works with Age

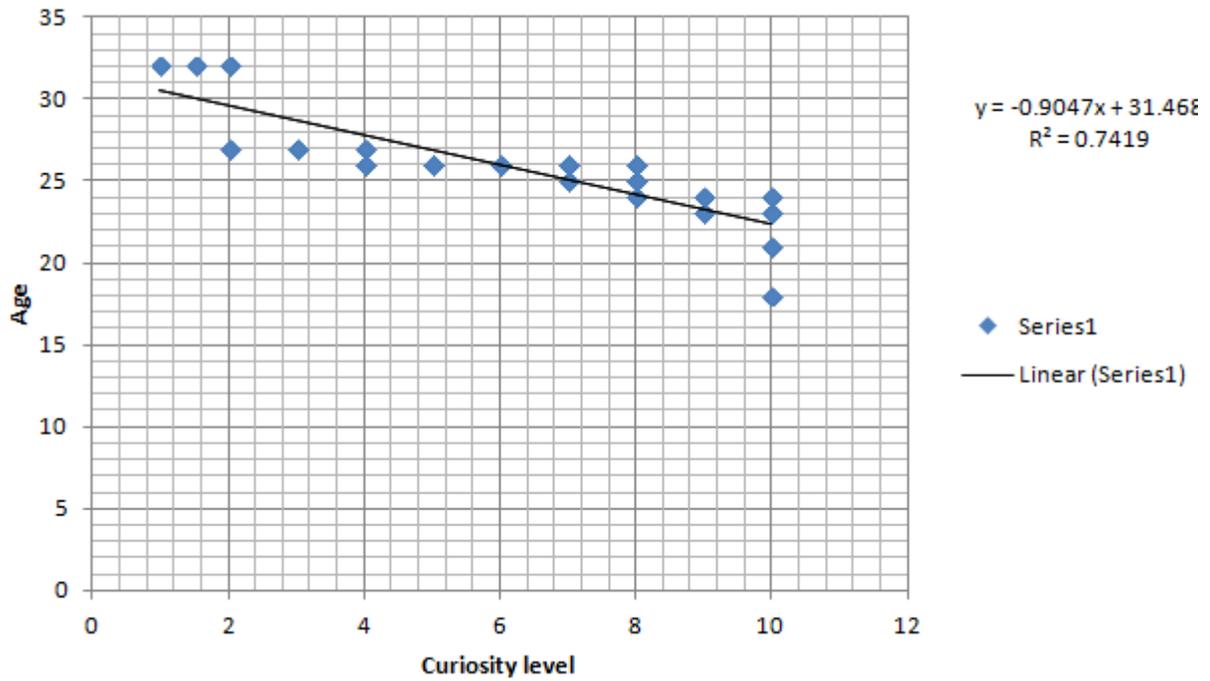


Figure 2. Re-usability Interest of a product with Age

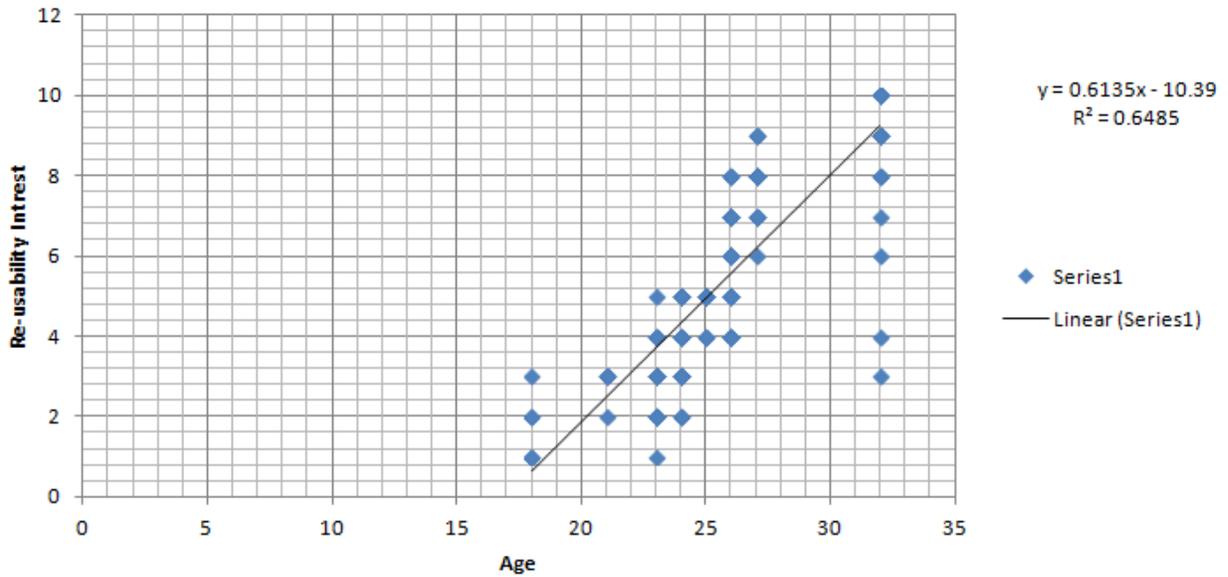


Figure 3. Importance to packaging with Age

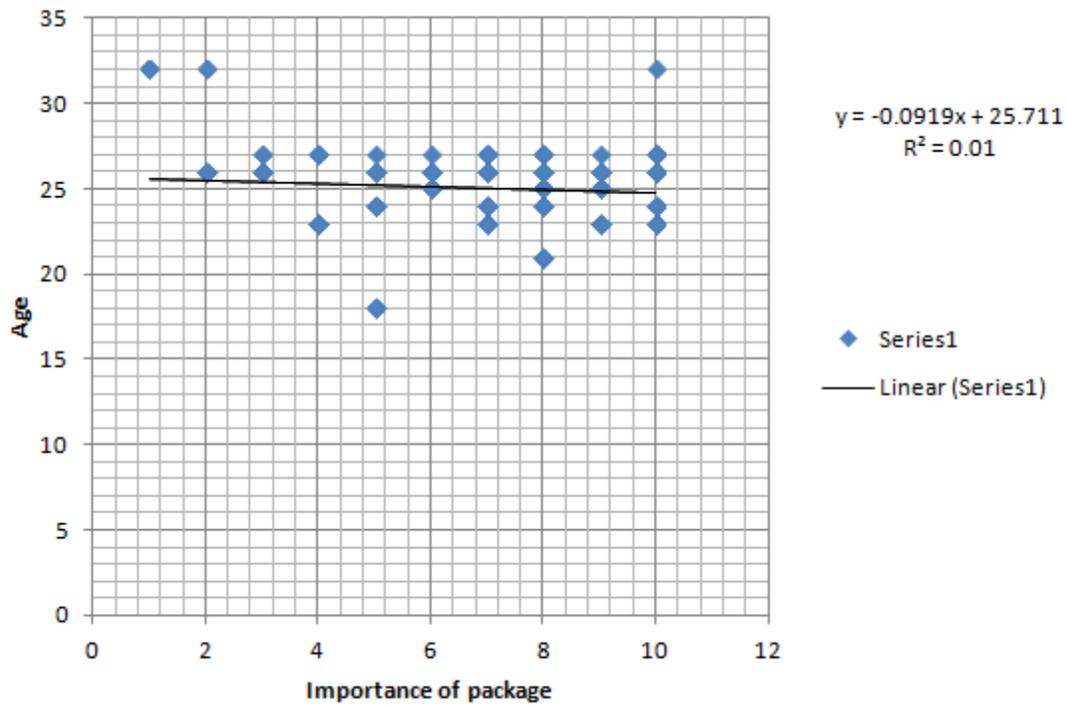


Figure 4. Spending potential versus multiple use potential

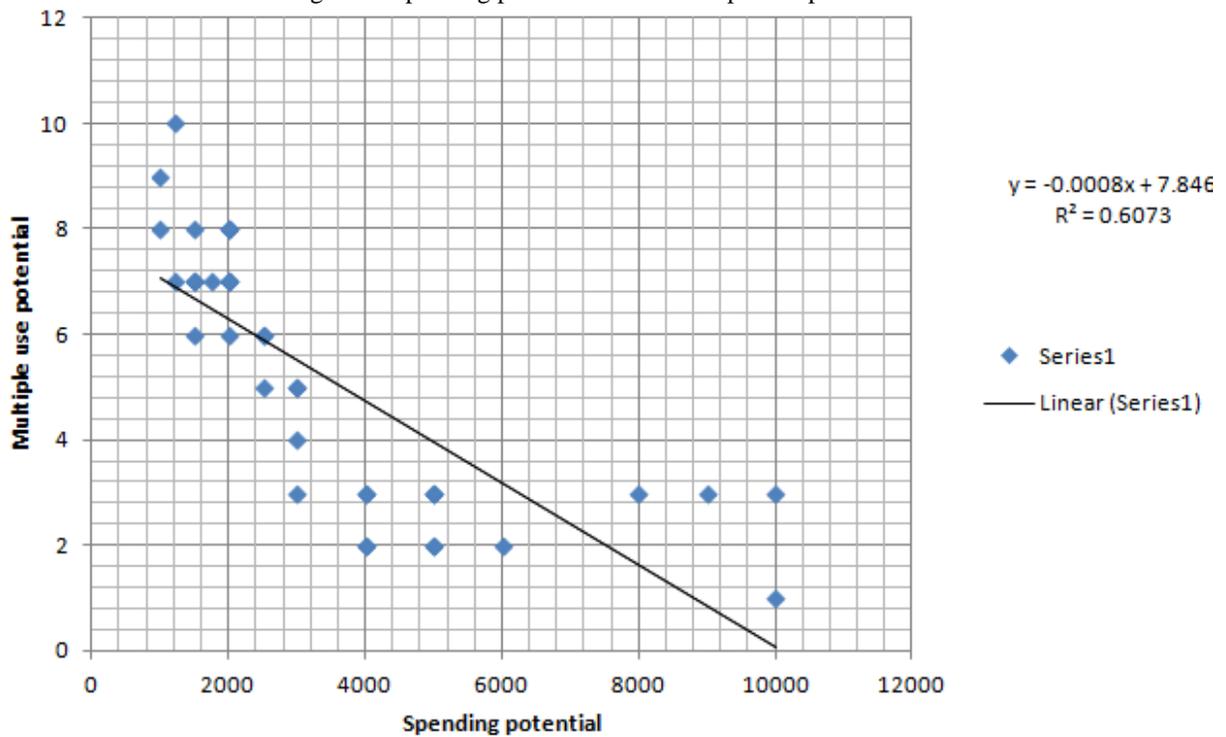


Figure 5. Opinion leadership versus multiple-use potential

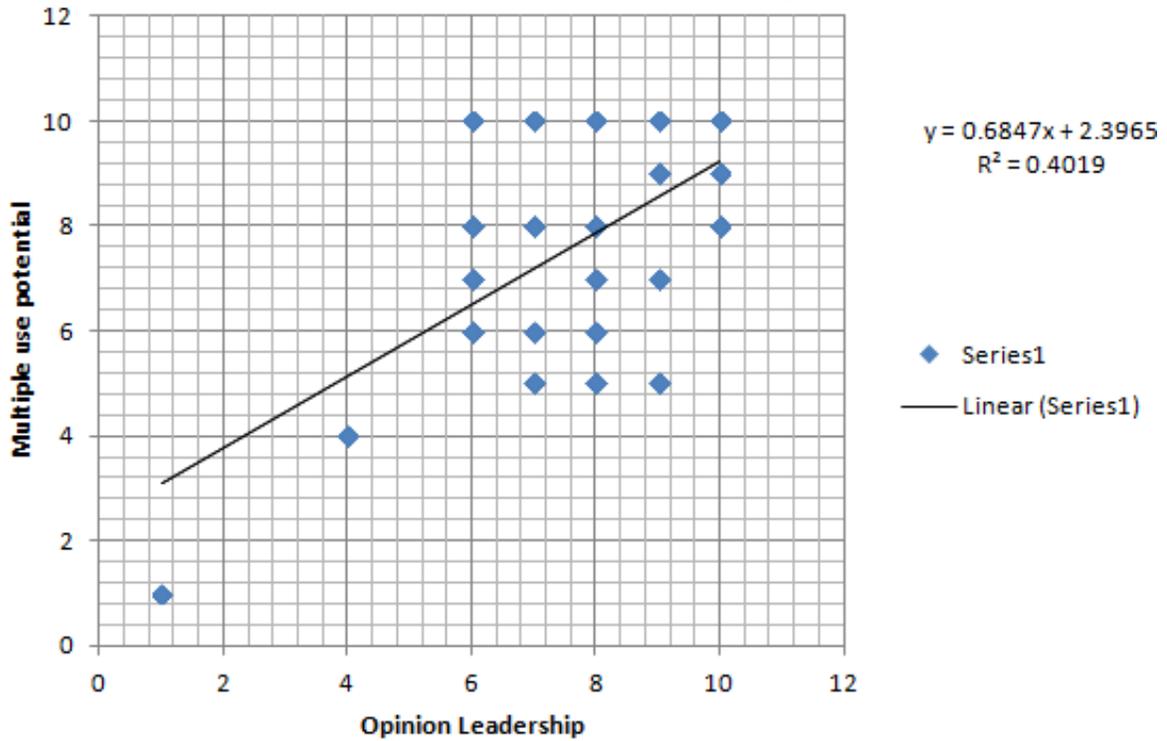


Figure 6. High opinion leadership versus Re-usability of product

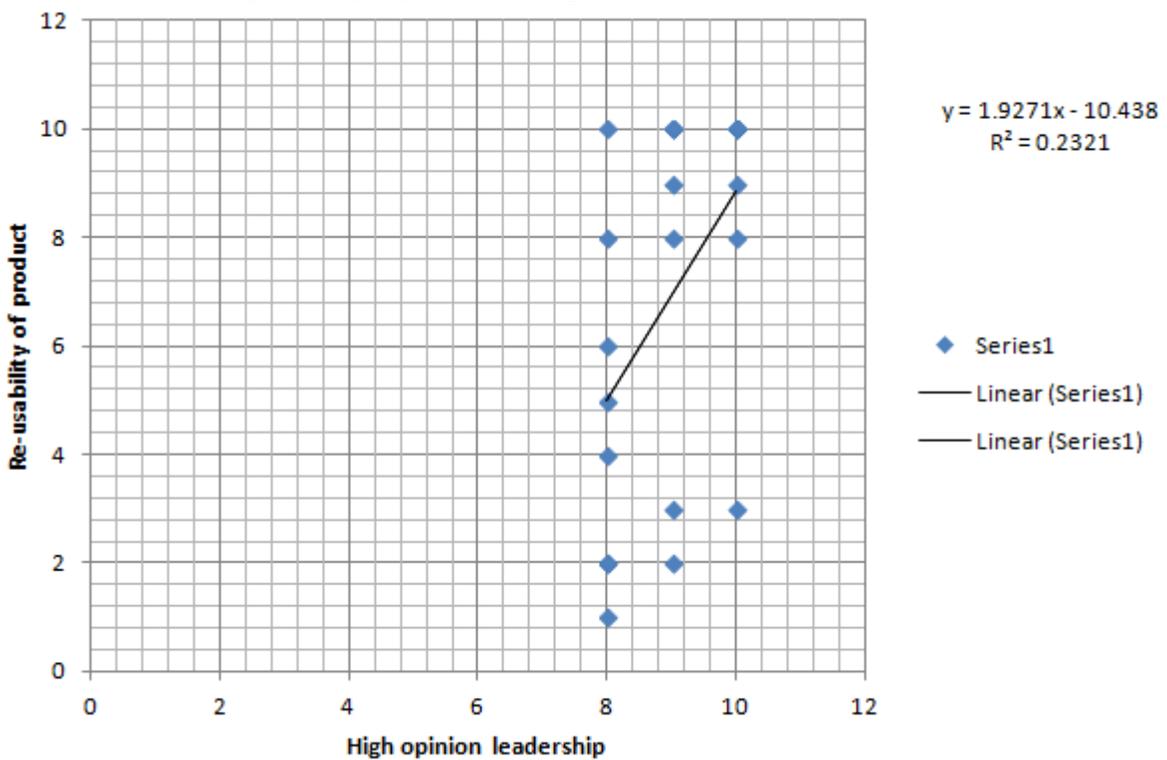


Figure 7. High opinion leadership versus importance to packaging

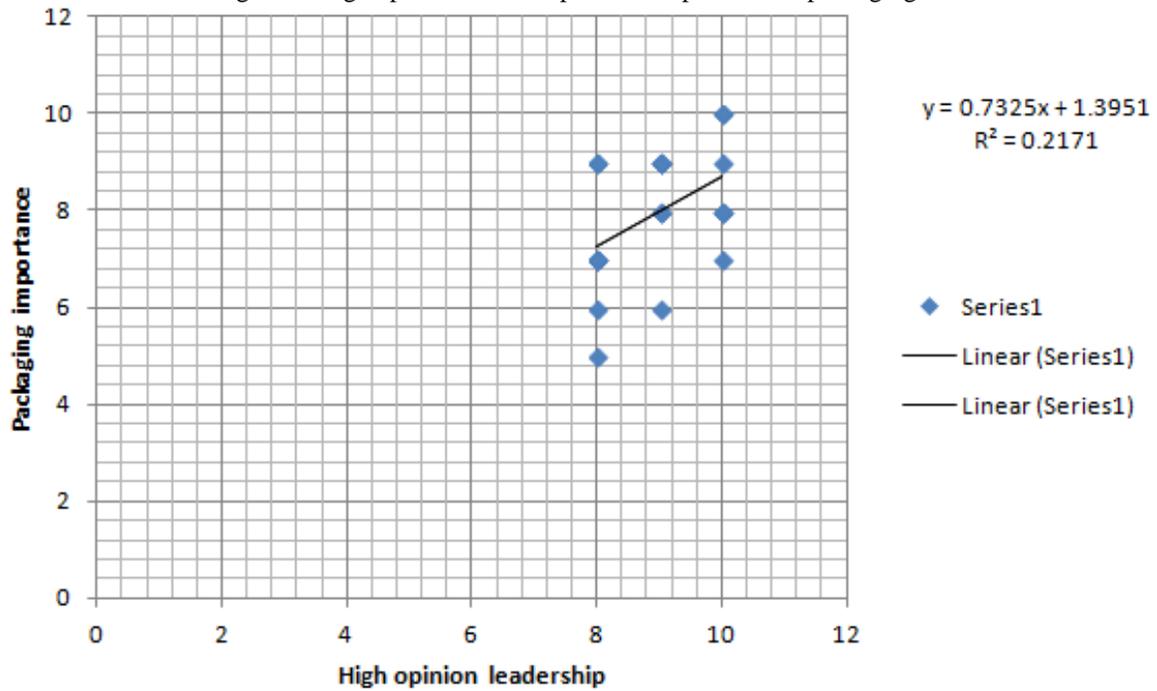


Figure 8. Opinion dependency on others versus fear for buying new products

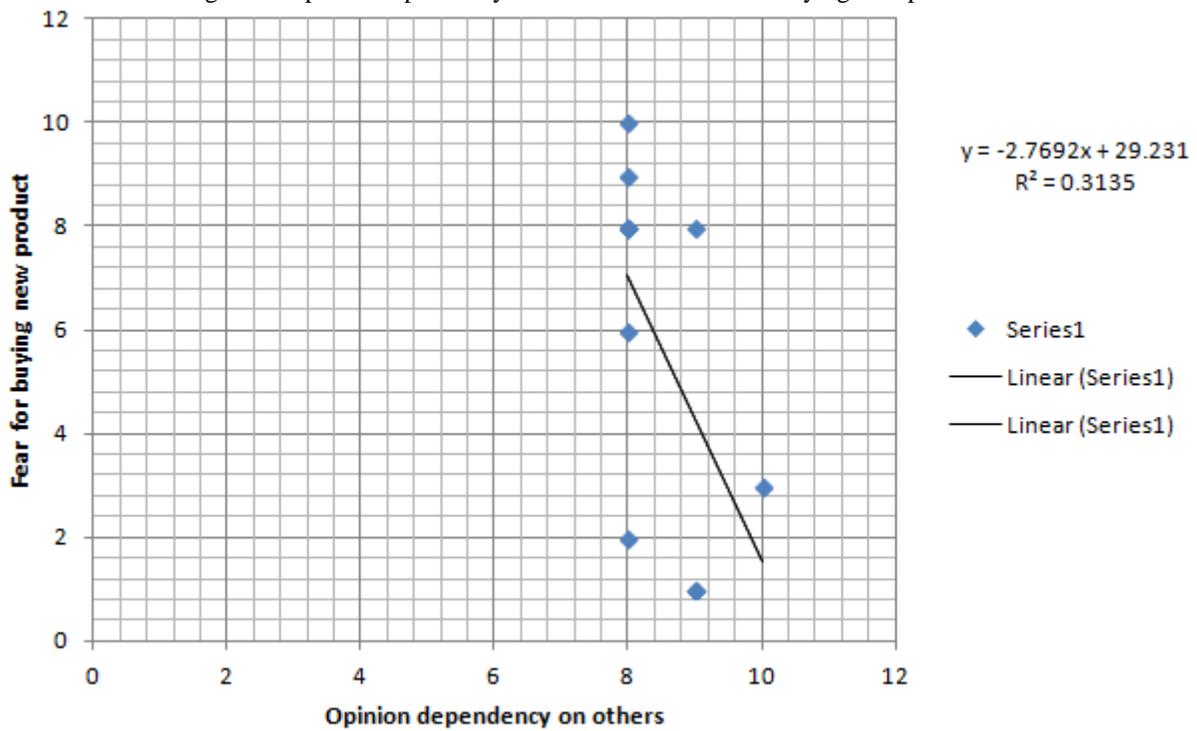


Figure 9. Skeptical about new product versus fear of usage.

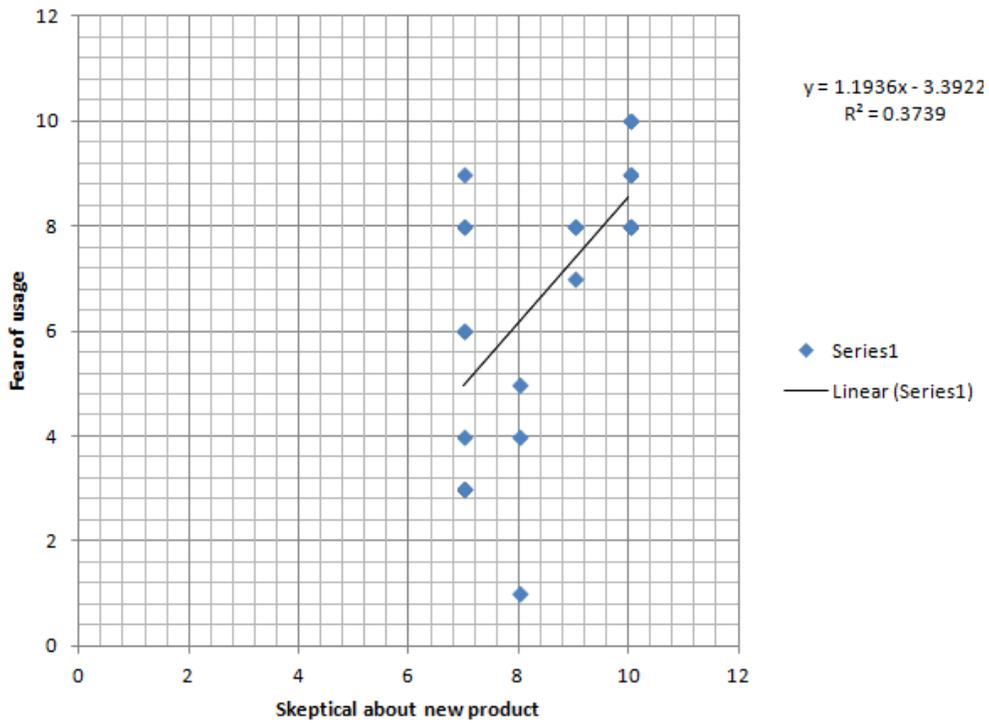
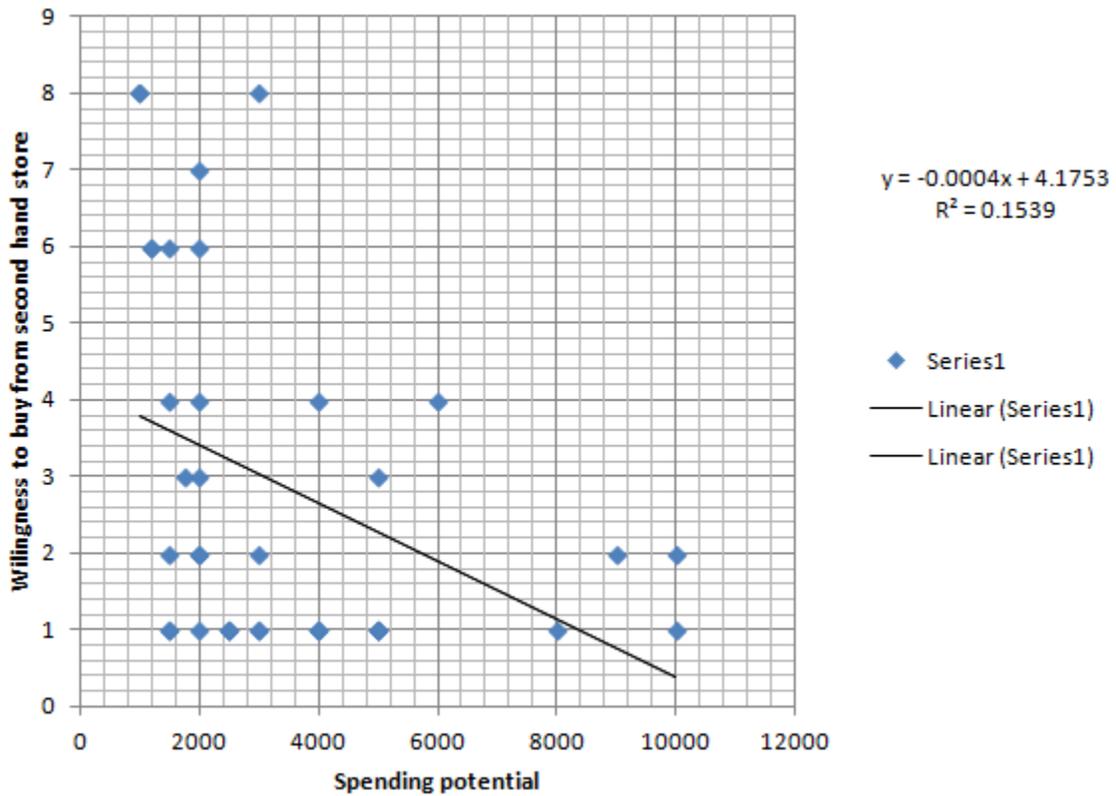


Figure 10. Spending potential versus willingness to buy from second hand store.



3.4. Test for Significance of Research Hypothesis

The results of multiple correlation analysis for significance testing show that whether the correlation between x1-y1, x1-y2, x1-y3, x2-y4, x3-y4, x3-y2, x3-y5, x4-y7, x2-y6 variables is positive/negative and the relation is strong (Table 4). From Table 4, nine out of 10 variables have H0 rejected, meaning that the relation between independent variables of x1-y1, x1-y2, x1-y3, x2-y4, x3-y4, x3-y2, x3-y5, x4-y7, x2-y6 strong linear correlation. Further, F test (variance analysis) is conducted to see for significance of regression coefficient between these variables.

The analysis result of regression significance using variance analysis (F test) shows that the variables of give bigger value of $F_{\text{calculation}}$ than F_{table} at significant level of $\alpha_{0.05}$. These results cause H0 to be rejected meaning that the regression coefficient of relation between Age(x1) and Curiosity to know how products work(Y1) , Age(x1) and Re-usability interest(Y2), Age(x1) and Interest of packaging (Y3), Spending potential(x2) and multiple-use potential(Y4), Opinion leadership(x3) and multiple-use potential(Y4), Opinion leadership(x3) and Re-usability interest(Y2) is significant and linear.

Table 3. Test for significance of research hypothesis

Variable	Regression Equation	Constant(a)	Regression coefficient(b)	H _o
x1-y1	$y = -0.9047x + 31.468$	-0.9047	31.468	Rejected
x1-y2	$y = 0.6135x - 10.39$	0.6135	-10.39	Rejected
x1-y3	$y = -0.0919x + 25.711$	-0.0919	+25.711	Accepted
x2-y4	$y = -0.0008x + 7.846$	-0.0008	+7.846	Rejected
x3-y4	$y = 0.6847x + 2.3965$	0.6847	+2.3965	Rejected
x3-y2	$y = 1.9271x - 10.438$	1.9271	-10.438	Rejected
x3-y5	$y = 0.7325x + 1.3951$	0.7325	1.3951	Rejected
x4-y7	$y = -2.7692x + 29.231$	-2.7692	+ 29.231	Rejected
x2-y6	$y = 1.1936x - 3.3922$	1.1936	- 3.3922	Rejected

IV. DISCUSSION

As in Figure 1, the significant relation between Curiosity level to understand how a product works with increasing Age decreases showing a near to 1 negative correlation which implies that age is a crucial factor in understanding how curious users become while buying a new watch of Titan. It is important to know the percentage of young/old population to first relate under which stage of technology adoption cycle they may fall into. Usually, young population are the innovators who look at taking the risks. We could say as per the sample, the product development should take the lines of building curiosity to understand the product on how it works, which will give a very positive impact on major population. As there is almost very strong correlation between Age and curiosity as per our study of Titan users.

In figure 2, as we can see there is a strong positive correlation between Age and Re-usability interest for a product, age increases people tend to look at re-using the product in different ways. Which means, population study is important while developing a new product. There has to be minimum importance and investment given to re-usability design /sustainability design into the new product of Titan watches, because of percentage more of innovators and Early adopters are the ones who propagate the product.

In figure 3, as we can see age is not the significant relation to importance of packaging. Almost all the age groups

consider packaging as an important factor for considering use innovativeness of the product. Particularly, for Titan watches packaging is one of the most important attraction especially people save the packaging for most important reason like warranty.

In figure 4, spending potential versus multiple use potential is plotted, there is a significant negative correlation between these two factors because, it implies higher the spending potential of the user, people are least looking at multiple ways of using the product. Especially for the Titan watches. Which means, design has to be simple for high spending potential population and at low spending potential population design of a watch has to be with more features.

In figure 5,6,7 study is made for high opinion leadership people who are early adopters of technology adoption cycle usually, these are the most important population for any company to propagate or penetrate its product to next stage and to achieve greater penetration power. Therefore, study is made to understand how early adopters think of multiple use potential of the product. It is highly important, because their opinion matters. Therefore, as per study now. Opinion leaders think multiple-use potential, re-usability and importance of packaging are highly important factors for them. Therefore, a company like Titan must look at their users adoption to the products and keep going for a change in design as the stage of adoption changes. We can conclude that, Opinion leaders consider multiple-use potential, re-usability and importance of

packaging as important factors for high opinion leaders/early adopters and must be considered in developing a new product after the product moves into that stage.

In Figure 8, we could see that low opinion leaders, or people who depend on other for first opinions fear less for buying a new product. It has significantly negative correlation between low opinion leaders and their fear of buying a new product.

In Figure 10, high spending potential versus willingness to buy from a second hand store is studied and found that it is significantly negatively correlated. Hence, high spending potential people go least for second hand stores. Titan has to look at devising a strategy for turning the low spending potential users towards them instead of users going to second hand stores.

V. CONCLUSION

Based on the data and discussion analysis results, it can be concluded that

- (1) There is a significant relation between Curiosity level to understand how a product works with increasing Age;
- (2) there is a strong positive correlation between Age and Re-usability interest for a product
- (3) Age is not the significant correlation to importance of packaging.
- (4) There is a significant negative correlation between these two factors, implies higher the spending potential of the user, people are least looking at multiple ways of using the product.
- (5) Opinion leaders/Early Adopters think multiple-use potential, re-usability and importance of packaging are highly important factors for them.

(6) Low opinion leaders or people who depend on other's for first opinions fear less for buying a new product.

(7) High spending potential people are least interested for second hand stores.

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