

CRITICAL FACTORS FOR THE SUCCESS OF INNOVATIVE PRODUCTS OF SMALL ENTREPRENEURS

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ABSTRACT

Small Entrepreneurs are major contributors to the economic growth and job creation. They discover new ideas and business opportunities, brings together funds to establish a business, organizes and manages its operations in order to provide economic goods and services. Entrepreneurs have strong convictions, self motivation, the will to grow and prosper tremendously. Entrepreneurship is the risk taking ability of the individual coupled with correct decision making. In this research an attempt is made to explore the factors contributing to the success of the innovative products of small entrepreneurs statistically. This paper provides guidelines for the success of the products for small entrepreneurs. This could help to improve the ability of small entrepreneurs to develop and prosper in an increasing competitive and complex world. A model has been developed to forecast the success or failure of the product which will be useful for small entrepreneurs.

KEYWORDS: *Entrepreneur, success factors, forecasting model.*

I. INTRODUCTION

The end result of a manufacturing process is a product to be offered to the marketplace to satisfy a need or want. Thousands of new products are introduced to the market every year. Many small entrepreneurs developing new products and modification to the existing products have become a necessity and a way of life. Discovering which factors or practices lead to business success and failure is a primary and yet unfilled purpose of business. Understanding user needs, external and internal communications, product advantages and marketing efforts have been found to be related to the product success of small entrepreneurs [1].The context was India, a developing nation bound in a multitude of traditions and inertia. In spite of the importance and magnitude of the monetary expense, the area of new products is still fraught with failures, risks and difficulties [2].Entrepreneurs are able to spot options and create new directions for an industry. Typically they deal with ambiguity and change and that is a prerequisite for success in today's fast paced business world. They can distinguish real from imaginary pitfalls and the brightest among them can turn error into opportunity[3].Entrepreneurs always operate at the edge of their competence , focusing more of their resources and attention on what they do not yet know(e.g.; investment in R&D) than on controlling what they already know. They measure themselves not by the standards of the past but by visions of the future. Innovation is an essential ingredient for today's social and economic growth. It improves the quality of life, raise standard of living and enables entrepreneur to grow and prosper. Innovation is creating and introducing new ways of doing things, better use of goods, more efficient services and systems. Innovation use knowledge and information. It is desirable to develop a model that enables accurate prediction of the outcome of a new product before heavy expenditures are incurred [4]. Though there are many models to predict the success of the products of big Entrepreneurs all existing

models require large number of data to forecast and hence there is need to have model to visualize the products at the idea stage itself based on the innovators thinking and their capabilities with single set of data. An attempt has been made to predict the success of the products of small entrepreneur based on single data [5]. Research Methodology chapter deals with how the research was conducted, about the questionnaire format. Results and discussion chapter discusses the various statistical tools used for the analysis. Conclusion chapter deals with the findings of this research.

II. RESEARCH METHODOLOGY

This research relied on primary data collected by the survey method. The data was collected from the users about the product of small entrepreneurs. The first survey data were collected from users of arecanut peeling machine. A set of 52 questionnaires was prepared. These questionnaires were grouped into eight factors viz; Consumer, Government Role, Economics of the product, Physical characteristics, Attributes of the product, marketing of the product, Entrepreneur's attribute, Environmental condition. Consumer factors refer to the consumer's purchasing capacity of the product, status of the consumer. Government role refers to certifications and support from the Government. Economics of the product refers to the cost resale value, fuel consumption savings in time. Physical characteristics refer to weight, compactness, space occupation, availability in different size and quantity. Attributes of the product refers to reliability, robustness, safety, efficacy, adaptability, repairability. Marketing of the product refers to after sales service, resale value, self repairable. Entrepreneur's attribute refers to the investment capacity of the Entrepreneur, his capability to take risk, his capability of involvement etc. Environmental condition refers to labor availability, Government policies. A five point Likert scale [6] ranging from 1=Unsatisfactory to 5=excellent was used to measure the extent to which users respond to each variable. The users were from different locations, varying economic condition and rural background. The users were personally contacted and interviewed. They were given the set of questionnaire and asked to fill up the questionnaire and their opinion about the product. The factors are given below:

SI No	Factors
G1	Consumer
G2	Government Role
G3	Economics of the product
G4	Physical Characteristics
G5	Attributes of the product
G6	Marketing of the product
G7	Entrepreneur's attribute
G8	Environment condition

Addresses of users of the products were obtained from the entrepreneurs who manufacture the product and market on their own. Arecanut peeling machine was taken for the research purpose. The small entrepreneurs are V-tech Thirthahalli, Dharma Technologies, Tumkur, SR Agrotech, Tumkur. These entrepreneur's machine was approved by Agriculture Department, Govt of Karnataka. They have produced innovative products namely Arecanut peeler, Arecanut polisher, Mini tipper.

III. RESULTS AND DISCUSSION

1. Reliability of the data:

Using Reliability calculator the reliability and validity of the data was found. The Cronbach alpha[7] was found out to be 0.9545. This means that the data collected was reliable and valid.

2. Correlation Coefficient:

The correlation Coefficient analysis was carried out. The Correlation Coefficient matrix is given below

	G1	G2	G3	G4	G5	G6	G7
G2	0.240						
	0.322						
G3	0.443	0.560					
	0.058	0.013					
G4	0.447	0.351	0.787				
	0.055	0.141	0.000				
G5	0.370	0.732	0.803	0.616			
	0.119	0.000	0.000	0.005			
G6	0.365	0.377	0.716	0.659	0.811		
	0.124	0.112	0.001	0.002	0.000		
G7	0.102	0.655	0.545	0.201	0.547	0.357	
	0.677	0.002	0.016	0.408	0.015	0.134	
G8	-0.049	0.720	0.595	0.583	0.739	0.589	0.499
	0.841	0.001	0.007	0.009	0.000	0.008	0.030

Cell Contents: Pearson correlation

P-Value

The Pearson Correlation Coefficient between the groups was obtained. It was found that G4 & G3, G5 & G3, G6 & G5, G8 & G5 are strongly correlated as the Pearson Coefficient is greater than 0.7 .

3. Regression Analysis:

The Regression analysis was done to predict the success of the product. Considering G7 (Entrepreneur's attribute) as dependent variable and other variables as independent variable a multiple regression model was obtained in the form of an equation:

$$G7 = 8.44 - 0.027 G1 + 0.221 G2 + 0.232 G3 - 0.168 G4 - 0.0503 G5 + 0.111 G6 + 0.042 G8$$

Predictor	Coef	SE Coef	T	P
Constant	8.440	3.934	2.15	0.055
G1	-0.0273	0.1585	-0.17	0.867
G2	0.2211	0.1879	1.18	0.264
G3	0.2323	0.1270	1.83	0.095
G4	-0.1678	0.1250	-1.34	0.207
G5	-0.05025	0.08421	-0.60	0.563
G6	0.1114	0.2385	0.47	0.649
G8	0.0420	0.1681	0.25	0.807

S = 1.16415 R-Sq = 59.1% R-Sq(adj) = 33.0%
 PRESS = 38.3453 R-Sq(pred) = 0.00%

4. Hypothesis Testing [8]:

This test was conducted between two entrepreneurs who are leading manufacturers of arecanut peeling machine namely V-Tech and Dharma Technologies. The test was conducted on 3 Groups of factors namely;

G1	Role of consumer
G4	Physical Characteristics
G6	Marketing of the product

The hypothesis are :

H1: There is no significant difference between two companies with respect to the role of Consumer
H2: There is no significant difference between two companies with respect to the physical characteristics of the products
H3: There is no significant difference between two companies with respect to the marketing of the products

a.G1-Consumer

Two-Sample T-Test and CI: g1, g1_1

Two-sample T for g1 vs g1_1

	N	Mean	StDev	SE Mean
g1	7	22.57	3.74	1.4
g1_1	7	24.14	2.34	0.88

Difference = mu (g1) - mu (g1_1)

Estimate for difference: -1.57143

95% CI for difference: (-5.28348, 2.14062)

T-Test of difference = 0 (vs not =): T-Value = -0.94 P-Value = 0.368 DF = 10

H1: There is no significant difference between the two entrepreneurs with respect to the role of consumer as P value is >0.1

b.G4-Physical Characteristics

Two-Sample T-Test and CI: g4, g4_1

Two-sample T for g4 vs g4_1

	N	Mean	StDev	SE Mean
g4	7	38.29	4.19	1.6
g4_1	7	36.86	2.91	1.1

Difference = mu (g4) - mu (g4_1)

Estimate for difference: 1.42857

90% CI for difference: (-2.06769, 4.92483)

T-Test of difference = 0 (vs not =): T-Value = 0.74 P-Value = 0.476 DF = 10

H2: There is no significant difference between the two entrepreneurs with respect to physical characteristics of the product as P value is >0.1

C.G6-Marketing of the Product

Two-Sample T-Test and CI: g6, g6_1

Two-sample T for g6 vs g6_1

	N	Mean	StDev	SE Mean
g6	7	13.14	2.12	0.80
g6_1	7	13.86	2.19	0.83

Difference = mu (g6) - mu (g6_1)

Estimate for difference: -0.714286

90% CI for difference: (-2.782698, 1.354127)

T-Test of difference = 0 (vs not =): T-Value = -0.62 P-Value = 0.548 DF = 11

H3: There is no significant difference between the two entrepreneurs with respect to marketing of the product as P value is >0.1

5. Percent Contribution[9]:

The percent contribution indicates the relative power of a factor .It is a function of sums of squares for each significant group of factors

Groups	ss	var	% P
G1	10385	8.287	5.689541
G2	1185	10.953	0.643729
G3	16513	23.21	9.041335
G4	26496	22.83	14.51521
G5	115245.3	96.98	63.13568

G6	3458	6.427	1.892494
G7	1367	2.023	0.748415
G8	7733	18.427	4.229892
Total	182382.3	189.137	100

It was found that G5 contributes significantly with 63.13% and G2 contributes least with 0.64%

6. Analysis of Variances (ANOVA):

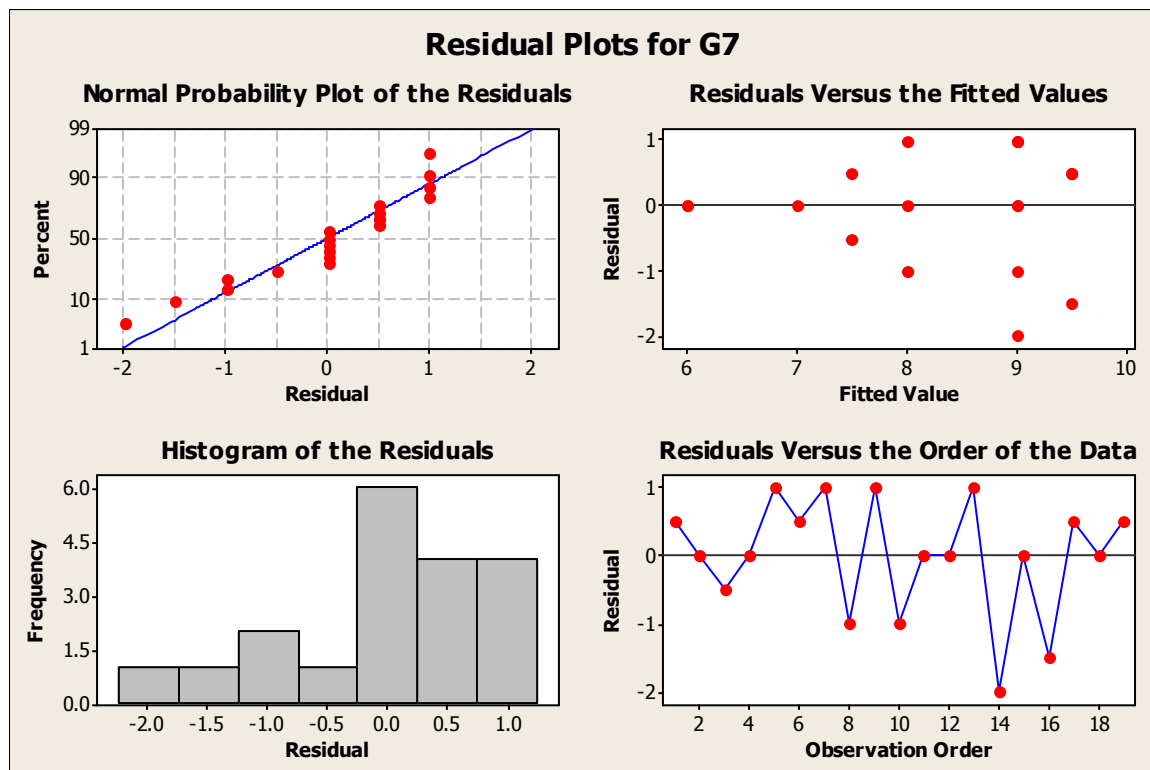
One way ANOVA analysis was done with respect to dependent variable G7 and an independent variable G2

One-way ANOVA: G7 versus G2

Source	DF	SS	MS	F	P
G2	6	22.92	3.82	3.40	0.034
Error	12	13.50	1.13		
Total	18	36.42			

S = 1.061 R-Sq = 62.93% R-Sq(adj) = 44.40%

The relevant graphs are shown below:



It is found that G2 and G7 are related to each other as p value is near to zero. But the other independent variables are not closely related like G2 which is as shown below

One-way ANOVA: G7 versus G5

Source	DF	SS	MS	F	P
G5	13	23.42	1.80	0.69	0.726
Error	5	13.00	2.60		
Total	18	36.42			

S = 1.612 R-Sq = 64.31% R-Sq(adj) = 0.00%

One-way ANOVA: G7 versus G8

Source	DF	SS	MS	F	P
G8	7	18.50	2.64	1.62	0.227
Error	11	17.92	1.63		
Total	18	36.42			

S = 1.276 R-Sq = 50.81% R-Sq(adj) = 19.50%

One-way ANOVA: G7 versus G1

Source	DF	SS	MS	F	P
G1	7	16.33	2.33	1.28	0.344
Error	11	20.10	1.83		
Total	18	36.42			

S = 1.352 R-Sq = 44.83% R-Sq(adj) = 9.71%

IV. CONCLUSION

It is found that for the success of product Entrepreneur should concentrate on all eight factors. Each factor has an impact on the success of a product. Especially for a new Entrepreneur Government support is most important. An Entrepreneur should have sufficient resources to convert customer needs to customer demand. The products which have failed lacked in providing the perceived superior advantages or the entrepreneur failed to effectively communicate to the user superior advantages. Entrepreneur lacked the credibility, competence and financial resources. Each of the entrepreneur failed to anticipate the problems in the turnaround of money and the consequence with respect to the successful commercialization the product. It may be concluded that the entrepreneur should give equal importance to all factors. If he neglects one factor it will have cascading effect on other factors.

REFERENCES

- [1]. Radiah Abdul Kadeer, Mohd Rosli Bin Mohamad, Ab.Azid Hi.Che Ibrahim, "Success factors for small Rural entrepreneurs under the one district one industry programme in Malaysia".
- [2]. Sharad Sarin,Gour.M.Kapur,1990, "Lessons from New Product Failures; Five case Studies", Journal of International Marketing Management, Vol 19, pp 310-313
- [3]. A Dale Timpe,2005,Book on Creativity, Jaico Publishing House, ISBN 81-7224-863-6
- [4]. Lo, Frang Cheong Wah, Foo Say Wei, Baully Jonh.A, "Multiple regression models for electronic product success prediction", IEEE International Conference on Management of Innovation and Technology 200,pp 419-422
- [5]. Rachana Chattopadhyay and Anjali Ghosh,2002,"Predicting Entrepreneurial success: A Socio-psychological study", Journal of Entrepreneurship,Vol:11(1),Page 21-31
- [6]. Wm.E.Souder, David Buisson and Tarry Garret,1997,"Success through customer- driven New product development: A Comparison of US and New Zealand Small Entrepreneurial High Technology Firm", Journal of Production and innovation Management,Vol:14,Page :459-472
- [7]. Goliath, "Predicting new product success or failure comparison of US and UK Practices", 2007,Journal of Comparative International Management, Page:1-6.
- [8]. Edward.G.Rogoff, Myung Soo lee and Dong Churl suh,2004,"Who Done it? Attributions by entrepreneurs and expert of the factors that and impede small business success", Journal of small business management, Vol:42(4),Page:364-376
- [9]. Phillip.J.Ross,2005,Book on Taguchi Techniques for Quality Engineering, 2nd Edition, ISBN-0-07-053958-8
- [10]. Nishika Patel, "Mastermind India", April 2010,India Today, pp 47-90
- [11]. Arne L. Kalleberg, Kevin T.Leight,1991,"Gender and Organisational performance: Determinants of small business survival and success", Academy of Management Journal, Vol 34,No1,136-161
- [12]. Michael P. Steiner and Olaf Solem, January 1988,"Factors for success in small manufacturing firms", Journal of small business management, pp 51-56
- [13]. Roger Calantone & Robert G.Cooper,1981,"New product scenario: Prospects for success" ,Journal of Marketing, Vol 45,pp 48-60
- [14]. Charles Jabani Mambula,2004,Realtng External Support, business Growth & Creating strategies for survival: A comparative case study, Analyses of small Manufacturing firms and Entrepreneur, Small Business Economics, Vol 22,pp 83-109
- [15]. Attahir Yusuf ,"Critical success factors for small business: perceptions of South pacific Entrepreneurs", April 1995,Journal of small business management, pp 68-73
- [16]. R.G.Cooper,1979,"The dimensions of industrial new product success and failure", Journal of marketing, Vol 43,pp 93-103
- [17]. Rosalind C. Paige and Mary A.Littrell,2002, "Craft Retailers' criteria for success and associated business strategies", Journal of small business management,Vol:40(4),pp 314-331

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