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1 **Predicting success for new flavors with information known pre-launch: a flavored snack**
2 **food case study**

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12 **Abstract**

13 Success in the marketplace is the goal of every product launch. Knowing what data to
14 collect before launching a product that could predict success would be valuable to companies.
15 Thus, the objective of this study was to determine whether success of new line extensions for a
16 multi-flavored snack product available internationally could be predicted from information
17 available before launch. Staff from 15 countries completed a questionnaire for each product and
18 included questions related to authenticity, familiarity, and capturing current trends, packaging
19 and market place issues such as product competition and pricing. Using 63 flavors, a
20 discriminant function correctly identified 75.8% successful products as successful and 66.7%
21 unsuccessful products as unsuccessful. Stepwise comparison determined the variables necessary
22 to correctly categorize the snack products: being a trendy flavor, new to the category, based off
23 foods from restaurants or traditional foods. These variables assisted in predicting in market
24 success for this product category.

25

26 **Keywords:** success, discriminant analysis, product development, stepwise regression

27 **Introduction**

28 Predicting success in the market, prior to a launch is difficult. Designing a strategy to
29 allow continuous introduction of new products into the marketplace before competitors will
30 increase the chance of success (Fortuin, Batterink and Omta, 2007). New products can come
31 from different paths to the marketplace including new concepts, new raw materials, line
32 extensions, reviving old products and targeting a new audience (Hanchate, 2006). As these new
33 products are created, the decision making processes in the innovation phase are used to help
34 ensure that the product is headed towards a successful launch (Vatthanakul, Jangchud, Jangchud,
35 Therdthai and Wilkinson, 2010; Jones and Jew, 2007). These processes include working in
36 cross-functional teams with other areas contributing to the development of the product (Wilson,
37 1994), creating as many different innovative ideas as possible (Jones *et al.* 2007), conducting
38 comprehensive market assessment and determining what the consumer wants (Bogue, Seymour
39 and Sorenson, 2006).

40 When completing a comprehensive market assessment it is critical to evaluate 10 factors
41 to define the definition of the product and improve the chance of success. Wilson (1989, p 14)
42 identified these factors as: “*strategic alignment, customer need, competitive analysis,*
43 *compliances, product positioning, select project priorities, identify technical and process risks,*
44 *identify appropriate market channels, management leadership, and human and financial*
45 *resources.*” For Hewlett-Packard (HP) if any of these portions were skipped, they found projects
46 fell short of projections and failed in the marketplace. However, when the cross-functional
47 teams worked together and these factors were considered and agreed upon, HP saw more
48 organized launches (Wilson, 1994).

49 As product ideas are developed and continue into the product development life cycle it is
50 necessary that all preliminary information from the consumer marketplace be collected. Starting
51 the product development phase without gathering knowledge of what needs the product must
52 satisfy will not lead to a project focused on success (Buisson, 1995). The biggest challenge is
53 the tedious job of collecting all necessary information from the consumer marketplace and
54 knowing which requirements are the most critical to consumers for success. Because consumer
55 needs often change slowly it is possible to collect the necessary information from the consumer
56 and then only update or confirm the information previously collected (Krieg, 2004).

57 Predicting whether or not a product will be successful in the marketplace is determined
58 based on calculating risk (Penn State, 2007). These risks include timing of launch, product price,
59 competitors, marketing support (Chomka, 2003), focus on consumers wants and needs (Ottesen
60 and Grønhaug, 2005) and adaptability to market changes. Creating flavor fusions in new
61 markets using export opportunities requires adaptability since the ethnic flavors may be familiar
62 and acceptable in the country it was developed in but may be unfamiliar to the new target
63 country. In order to increase the chance of success it is important to learn about acceptable
64 variables by product testing and looking at the product as part of the new country's daily life
65 (Tuorila, Andersson, Martikainen and Salovaara, 1998).

66 Timing of launch is also important to consider in order to reduce risk of failure. If an
67 appropriate time/season does exist for the product (e.g. launch of white chocolate and cinnamon
68 flavors at Christmas time coinciding with a movie release, Watson, 2003), then launching the
69 product at that time will increase consumer awareness of the product (Wilson and Norton, 1989).
70 Product pricing also is critical for success. Sometimes new products are priced higher or
71 promoted as premium products in order to pay for the innovations used to create the product.

72 Other times, companies will take a decrease in profit short-term to maintain a more reasonable
73 price to encourage first time buyers to try the product (Rajagopal, 2008).

74 Many studies have evaluated critical product attributes for consumers through various
75 procedures (see e.g. Chung et al., 2011; Parente, Manzoni and Ares, 2011; Chrea et al., 2011,
76 and Lee et al., 2010). Although it is known that keeping the end-user in mind will require
77 staying in touch with the consumer through the whole project, it is sometimes difficult to do this,
78 especially if there is not funding to support such extensive testing (Harmsen, Grunert and
79 Declerck, 2000). If this is the case, looking at previously collected data or information that could
80 be known prior to launch of the product could lead to enhanced decision making. The objective
81 of this study was to determine whether success could be predicted from information available
82 before launch.

83 **Materials and Methods**

84 An international food manufacturer was contacted and agreed to provide information for
85 this study. The study was conducted using a flavored snack food available in many international
86 markets. Conversations with product development and marketing teams in the company
87 generated various options for market and product selection. Ultimately, a flavored snack food
88 product made from a similar base product was selected because it is widely available in many
89 international markets on all continents. Additional discussions related to market selection
90 consisted of factors such as product development activities for the country (an active product
91 development program for the country was needed), whether information would be readily
92 available (e.g., markets with major recent staff turnover were excluded because new staff might
93 be unable to provide some answers on past products), and market breadth (a wide range of
94 countries was desired).

95 Countries and Products

96 For the study 15 countries provided a list of successful and unsuccessful flavors launched
97 in the past 5 years. Countries contacted were: Argentina, Australia, Brazil, China, Egypt, India,
98 Mexico, Poland, Russia, Spain, South Africa, Thailand, Turkey, United Kingdom (UK) and the
99 United States (US). Initial data was requested on three successful and three unsuccessful flavors
100 from each of the countries, some countries responded with more products than were requested
101 while other responded with less. Each flavor was identified and classified by the country as
102 either successful, having been in the market longer than 1 year, or unsuccessful, having been
103 removed from the market in less than 1 year. To be included in the study, each product had to
104 have met initial liking hurdles set by the international company, with local input, for launch. The
105 products each country selected were to include only problems perceived as product related rather
106 than ones the company felt were unsuccessful because of in-market launch execution problems.
107 For example, products introduced with minimal marketing or promotional support after launch
108 products introduced with poor market timing, or seasonal products that were intentionally
109 introduced only for a short time. Initial questions were asked to assure that all products were
110 accurately chosen:

- 111 • Was this product successful or unsuccessful?
- 112 • Was the introduction and marketing of this product executed well?
- 113 • Where there any cost issues affecting the product (e.g. premium pricing)?
- 114 • Was the product released with appropriate after-market support?

115 Any product that was not introduced well into the market area, had cost issues or did not
116 have appropriate market support were excluded from the study because the intent was to focus
117 on product characteristics that were known before launch that could help determine longer-term
118 (i.e., more than 1 year) success. There were 63 products that were selected for further evaluation
119 on the full questionnaire.

120 Questionnaire Development

121 A questionnaire was developed to collect as much information as possible about the
122 products that were launched into the marketplace. Figure 1 shows the questionnaire that was to
123 be completed on each of the products in the study. It included multiple choice questions, as well
124 as, yes/no and 5-point scales to collect information on the products.

125 In order to assure that data was collected on market (e.g., in-market sales and competitive
126 situation), product (e.g., liking, aftertaste and authenticity) and concept (e.g., purchase interest)
127 data, additional information was needed aside from the questionnaire. Since each product was
128 launched into the marketplace prior to the testing, actual data was collected on the performance
129 in the marketplace. These are the categories that market data was collected on:

- 130 • Product summary (SKU, target consumers, etc.)
- 131 • Time of launch and location
- 132 • Product concept fit
- 133 • Label information
- 134 • Percent share
- 135 • Trial and repeat
- 136 • Distribution
- 137 • Consumer testing

138 After developing the questionnaire it was distributed to product developers and/or flavor
139 scientists in each country to gather the requested information. Some of the questions were easily
140 answered by the product developer/flavor scientist, but others required assistance from other
141 departments within the company (e.g., marketing research). All questions were to be answered
142 in order to collect as much information as possible to be used for the data analysis.

143 For each of the successful/unsuccessful products, a questionnaire was sent to the contact
144 in each country by email in a word document. Countries then sent back the questionnaires for
145 each of the products as well as an excel file with the additional data information requested. Most
146 data was collected via email, but additional information was obtained by phone calls when

147 necessary. Extensive follow-up ensured as much data as possible was collected. Three countries
148 were unable to fully complete the questionnaires: Argentina, India and the US.

149 Data Analysis

150 Data from all countries were combined into a single data file. Scaled questions remained
151 as numbers and categorical questions were changed into 0/1 dummy variables. For example, a
152 yes/no question received a 0 for no and a 1 for yes. A question with four multiple choice
153 answers was converted to four dummy variables responses with one of the four responses
154 receiving an 1 and the other three answers receiving a 0. A stepwise discriminant analysis
155 (PROC STEPDISC in SAS[®] 9.2, Cary, NC, USA) was used to determine specific questions that
156 best classified the data into the successful and unsuccessful categories. Wilks' Lambda
157 multivariate test was used to determine significant differences between variables. The PROC
158 DISCRIM function then was used to give a classification table of correct and incorrect estimates
159 of the data into the two groups.

160 The discriminate function was first performed on all data collected on the products,
161 including data known pre- and post-launch., to determine the ability of the function to predict
162 success. A second discriminate function was calculated using only the information that would
163 have been known prior to or during the early stages of product development. For example, is
164 the product, a) new to the overall product category, b) a new variation in the category, c) a new
165 variation to the country, d) a familiar flavor, e) whether the flavor appears "authentic" to the
166 culture, f) based on a traditional dish, g) a dish found in most restaurants, h) a trendy flavor
167 (following an in-market trend flavor), i) promoting a 'healthy' concept, or j) being made with
168 problem ingredients.

169 **Results and Discussion**

170 Data Gathering

171 One difficulty in conducting this type of study is gathering the data and the determining
172 the impact that information can have on overall information. Data was gathered from the global
173 company's corporate headquarters and emails were sent to contact persons in each country
174 requesting them to return the information within one month. Only three countries responded
175 within the requested amount of time with complete data. Reminder emails, multiple telephone
176 calls, and corporate assistance in requesting information ultimately was necessary to get most of
177 the information. In total the time frame for gathering the data was approximately six months.
178 Of the 15 original countries selected, two of the countries did not provide enough information to
179 be included in the analysis, and one country did not provide any information that was requested.
180 Thus from the original set of 102 products from 15 countries data gathered from the 12
181 responding countries resulted in a total of 63 products with adequate information.

182 Internal Validation of the Information Gathered

183 When looking at all data collected the discriminant analysis estimated 100% of the
184 successful products as successful and 90% of the unsuccessful products as unsuccessful (Table
185 1). Thus, using information available both before and immediately after launch this study was
186 able to almost completely predict success or failure. This analysis serves as an internal
187 validation that the information collected was useful and could predict success in future studies.
188 Of course, using all data collected would not help predict success prior to a launch because the
189 product would need to be in the marketplace to collect some of the information.

190 Predicting Success with Information Known Pre-Launch

191 When limiting the collected information to the questions where information could be known
192 prior to launch the discriminant analysis estimated 75.8% of the successful flavored snack
193 products as successful and 66.7% of the unsuccessful products as unsuccessful (Table 2).

194 This prediction was found after the stepwise regression procedure reduced the 13 original
195 variables to four significant pieces of information that could make the data more easily
196 interpreted: 1) flavors new to snacks category in the country, 2) trendy, 3) traditional flavors and
197 4) flavors found in restaurants (Table 3).

198 It is important to recognize that some of the significant variables have a positive impact on
199 success and others a negative impact. In general, products that were successful were not new
200 flavors to the general snack food category. However, successful products could and often were
201 traditional or currently trendy flavors commonly found in restaurants. These findings suggest
202 that creating an entirely new flavor category within a product category can be a difficult task.
203 However, sometimes new products are ocused on a segment of the population (e.g., specific
204 ethnic groups or diabetics) or may be flavor fusions (i.e. the restaurant connection) of products
205 from other countries (Kühne, Vanhonacker, Gellynck and Verbeke, 2010; Watson, 2003)
206 creating success in a smaller group that can expand into the larger population. Taking a
207 successful product of one country and developing it to be acceptable in another country,
208 unfamiliar to that flavor, can create opportunities for new food flavors (Tuorila *et al.* 1998).
209 However, success using this approach may require substantially more market support.

210 New successful products were sometimes based on food that is traditional, has been around
211 in the country a long time, or is a trendy concept or idea. Traditional flavors can sometimes
212 catch the attention of an interested consumer and create impulse purchasing, then repeat purchase
213 (Jones *et al.* 2007; Watson, 2003). Trendy flavors tag onto current market trends (e.g., health)

214 often generating trial purchases, and when well executed can become staple flavors over time.
215 When a trendy flavor is matched with quality ingredients and carefully developed it can become
216 the right flavor at the right time (Anon, 1999). The interest that customers have for a trendy
217 flavor can stimulate the product in the market and create success (Bartels and Reinders, 2010;
218 Rajagopal, 2008; Shelldrake, 2008). However, trendy flavors also can be difficult because
219 “trends” are often fads that change rapidly and make it difficult to stay at the marketplace top
220 (Fortuin *et al.* 2007).

221 **Conclusions**

222 Predicting successful and unsuccessful products is key to achieving better success rates
223 for new product. Collecting as much information as possible prior to launch can help make a
224 better prediction. This information includes collecting data even before the product is developed
225 (i.e., whether the flavor is new to the overall category, a new variation in the category, based on
226 a dish found in most restaurants, a trendy flavor, promote ‘healthy’ concepts, etc.). The process
227 of collecting this information is not easy, and it requires patience and considerable
228 communication between researchers and departments with the needed information. However,
229 based on this case study coordinating analysis of such knowledge may be able to guide future
230 projects to successful fruition.

231 For flavored snack products (using only limited general information available to the
232 product developers) success rates of approximately 70% could be predicted. For this product
233 category, being a completely new flavor for the market generally predicted failure, but being
234 traditional, trendy, or a flavor commonly found in restaurants within a country often predicted
235 success. Considering half the products (50%) used in this study were unsuccessful, that data

236 improves the potential prediction of success from 50 to approximately ~70%, a major increase.
237 Using prior known information is potentially an easy way to increase the likelihood for success.

238 It is possible that additional specific information on the products (i.e., the specific sensory
239 characteristics of products) could improve that equation further, but such information was not
240 available in most countries. These questions worked well for the flavored snack products
241 category but may not be the exact same questions needed for another category. This research
242 identified a procedure including the kinds of questions that can be used to obtain successful
243 prediction in a category.

244

245

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337 **Tables**
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340
341

TABLE 1. DISCRIMINANT TABLE FOR PERCENTAGE OF SUCCESSFUL AND UNSUCCESSFUL FLAVORS CLASSIFIED USING ALL RESPONSES FROM THE QUESTIONNAIRE.

	Unsuccessful	Successful
Unsuccessful	90.0%	10.0%
Successful	0.0%	100.0%

342
343

344 TABLE 2. DISCRIMINANT TABLE FOR PERCENT OF SUCCESSFUL AND
 345 UNSUCCESSFUL FLAVORS CLASSIFIED USING INFORMATION KNOWN PRIOR TO
 346 LAUNCH.

	Unsuccessful	Successful
Unsuccessful	66.67%	33.33%
Successful	24.24%	75.76%

347

348 TABLE 3. IMPACT ON PREDICTION OF SUCCESS FOR SNACK FOOD FLAVORS
 349 BASED ON DISCRIMINANT ANALYSIS FUNCTION
 350

351

Variables	Impact on Prediction
New to product category	NE
New to salty category	NE
New to snack foods	Negative
Nothing like it on the market	NE
Familiarity	NE
New flavor dish to the country	NE
Regional flavor dish to the country	NE
Common flavor in Restaurants	Positive
Traditional flavor that has been around a while	Positive
Trendy flavor	Positive
Problem ingredients on the label	NE
Promoting a 'healthy' concept	NE

NE=No Effect

352

353 TABLE 4. WILKS' LAMBDA TEST FOR SIGNIFICANT VARIABLES FOR ATTRIBUTES
354 FROM STEPWISE REGRESSION

Variables*	Wilks' Lambda	P-value
New to snacks	0.92	0.03
Trendy	0.87	0.02
Traditional to country	0.78	0.00
Found in restaurants	0.73	0.00

*Table only shows variables that were significant at $P \geq 0.05$.

355

356

357 **Figures**

358

359 Figure 1: Questionnaire Distributed to Obtain More Product Information

360