

PRODUCT DEVELOPMENT IN THE PAINT INDUSTRY

THESIS

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By

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## CHAPTER I

### INTRODUCTION

#### Purpose

The purpose of this investigation is to study product development procedures used by the industrial concern today. More specifically, it proposes to review procedures which reveal the basic types of product development as they relate to the nature of product testing, the different uses of the tests, their limitations, and their application in both theory and practice.

Specifically, this investigation seeks answers to the following questions:

1. Exactly how important are the four basic types of testing, concept testing, test marketing, bench testing, and questionnaires, to the product development program?
2. How important is the cost of the program to a company?
3. How important is time to the product development program?

4. Do reliability and precision play an important role in the development program?
5. What is the average length of time involved in the development program?

This study measures the effectiveness of the four types of testing in the paint industry. The importance of time, reliability, precision, cost of the program, and the methods used are measured to find the degree of importance to the paint manufacturer. The paint companies selected for this study are major paint manufacturers. These concerns all use a variation of either one or all of the types of testing.

#### Related Studies

Similar studies made by Leonard Kaplan,<sup>1</sup> Masao Nakanishi,<sup>2</sup> and James T. Rothe<sup>3</sup> discovered that product research is used by industries to seek reasons why a product is succeeding or failing in its endeavors, with the response being used as guidelines and controls for future innovations of products.

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1 Leonard Kaplan, "Product-Concept Testing in New Product Development" (unpublished Ph. D. dissertation, New York University, 1968).

2 Masao Nakanishi, "A Model of Market Reaction to New Products" (unpublished Ph. D. dissertation, University of California, Los Angeles, 1968).

3 James T. Rothe, "An Empirical Investigation of the Product Elimination Decision" (unpublished Ph. D. dissertation, University of Wisconsin, 1969).

### Limitations of the Study

This study is limited in the primary research to the paint industry. Literature related to product development in general has been used along with other studies reported in this field.

### Sources of Information

The information in this study comes from three sources. Chapter II is an analysis of the currently accepted theoretical concepts in the area of product testing through the use of marketing literature and other secondary sources. Through the study of marketing research and marketing literature, insight was acquired in the theoretical procedures of product testing. The information on product development came from recent marketing research texts and periodicals dealing with the testing of products.

Chapter III presents the primary research which evaluates the use of product development by selected paint manufacturers. A questionnaire was used to obtain information from national paint producers concerning their use of product development, which test or tests they use in their program, the importance of the program cost, the importance of the reliability and precision of the test used, and the amount of time involved in completing the test.

### Organization of the Study

This study may be broken down into four major parts. Chapter I contains the introductory items, including sources of information, limitations to study, and purpose of the study. Chapter II is an analysis of the currently accepted theoretical concepts in the area of product testing, using marketing literature and periodicals as the major source. Concentration has been placed on four major types of product testing; these types are concerned with their use by industry. Chapter III consists of primary research and research reported in other studies, and Chapter IV contains the summary, analysis of the findings, and the conclusions drawn from the study.

## CHAPTER II

### CURRENT TRENDS IN PRODUCT DEVELOPMENT

#### Nature and Definitions of Product Testing

Manufacturers in every industry spend considerable amounts of time, money, and energy in the development of new products.<sup>1</sup> Statistics have shown that very few new innovations are successful in their endeavors.

...statistics...suggest a fairly high rate of new product mortality. One source reports that from 50 to 98% of new products are not successful. A report on the experience of 200 large manufacturers indicated that only one new product out of every five they placed on the market was successful.<sup>2</sup> The two most important reasons for failure were "lack of a well-thought-out marketing program" and "lack of pretesting of product with consumer".<sup>3</sup>

Other reasons given for the failure of products were:

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1 Kaplan, op. cit., p. 1.

2 Harry L. Hansen, Marketing Text, Techniques, and Cases (Homewood, Illinois: Richard D. Irwin, Inc., 1967), p. 468 as cited from Samuel C. Johnson and Conrad Jones, "How to Organize New Products," Harvard Business Review, Vol. XXXV, No. 36 (May-June, 1957), p. 50.

3 Ibid., as cited from a Survey made by the Ross-Federal Research Corporation, New York, as found in Peter Hilton, New Product Introduction for Small Business Owners, Small Business Management Series No. 17 (Washington, D. C.: Small Business Administration, 1955), p. 318.

Major reasons given for failure, in order of mention, were: inadequate market analysis, product defects, higher costs than anticipated, poor timing, competition, insufficient marketing effort, inadequate sales force, and weakness in distribution.<sup>4</sup>

The introduction of new innovations requires careful forethought and analysis of markets, cost, and profit.<sup>5</sup> Various methods have been formed over the years with product testing being dominant.

The basic goals of product research are public acceptance of the product, feedback, and profit on the product.

Product research is used to seek reasons why a product is succeeding or failing. Such information provides guides and controls for future innovations of products.... Literally thousands of new ideas are generated daily. Yet, all such ideas cannot be adopted and yield sufficient volume of sales to make them profitable.<sup>6</sup>

This leads to the question, "How are products tested?" The four most important types of testing are: concept testing, market testing, bench testing, and questionnaires. These names vary in meaning from person to person. Before continuing, therefore, each of the above terms will be defined.

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4 Hansen, op. cit., p. 468, as cited from "Why New Products Fail," The Conference Board Record, National Industrial Conference Board, (October 1964), pp. 11-18.

5 Ibid., p. 468.

6 Weldon J. Taylor and Roy T. Shaw, Jr., Marketing: An Integrated, Analytical Approach (Cincinnati, Ohio: Southwestern Publishing Company, 1969), pp. 514-515.

### Concept Testing

Concept testing in various forms may be carried out by management in the planning stage of a new product. Product concept testing is a procedure designed to provide information about consumer attitudes toward proposed product concepts before the actual production of the product. It is a tool of management to help them fulfill the marketing concept where new products are designed to satisfy consumer needs, wants, and desires.<sup>7</sup>

Product concepts are ideas and notions preconceived by the consumer about the product. They are the mental images of product qualities.<sup>8</sup> As one author puts it,

A concept test contains a complete and graphic description of a product and provides a means of obtaining reactions to the product from a panel that is representative of prospective consumers. The methods of conducting the tests are unlimited; the method selected depends on the type of product and the genius of the researcher.<sup>9</sup>

This may be illustrated by the following example: a firm will introduce a product to a certain segment of the market. By doing so, it hopes to attain a favorable response from the consumer toward the product.<sup>10</sup> By using this method

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7 Kaplan, op. cit., p. 2.

8 Ibid.

9 Taylor, op. cit., p. 515.

10 J. Howard Westing and Gerald Albaum, Modern Marketing Thought (New York: The Macmillan Company, 1969), pp. 269-273.

of testing, management is able to take the data gathered, analyze it, and determine the future of the product being tested. The concepts on the test are not staged in any specific market segment but on an overall total scale. By doing so, management is able to select those products which are the most acceptable to the consumer.<sup>11</sup> However, it should be noted that management runs a risk by using concept testing. This method of testing enables competition to manufacture a like product.<sup>12</sup> Care must be taken to make the product more acceptable to the consumer. This is done by giving the consumer a product which meets his requirements.<sup>13</sup>

#### Bench Testing

Bench testing is just what it implies. It is a working model of the product that is being tested. It involves acquiring information from a select few who have been asked to use the product.<sup>14</sup> As one author puts it, from the knowledge gained through this method,

...an estimate may be made of what the volume of possibilities may be if the product is made and sold in a mass market. This process may be repeated until an acceptable product is developed.<sup>15</sup>

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11 Taylor, op. cit., pp. 515-516.

12 Westing, op. cit., pp. 269-275.

13 Taylor, op. cit., p. 516.

14 Ibid.

15 Ibid., p. 517.

There are various methods by which this type of testing is performed. The use of a firm's employees to test the product is often used. Also, a manufacturer may obtain opinions from both his sales force and employees.<sup>16</sup> Automobile manufacturers produce a limited number of models -- test models -- and select certain consumers to try them out. When interest in the test models increases sufficiently, mass production of the model can be started. Such testing has provided the manufacturer with feedback and has had a marked impact on trends. At no one point will the manufacturer commit himself to mass production until the mass market develops into maturity.<sup>17</sup>

### Test Marketing

Market testing may be defined by the following author's viewpoint:

Market testing of new products involves the trial re-production on a small scale of the planned full-scale marketing program for a new product. Its purposes are:

- . To determine the acceptability of the new product and the effectiveness of its accompanying marketing program.
- . To measure the probable marketing success of the new program.

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<sup>16</sup> Charles F. Phillips and Delbert J. Duncan, Marketing Principles and Methods (Homewood, Illinois: Richard D. Irwin, Inc., 1968), pp. 569-573.

<sup>17</sup> Taylor, op. cit., pp. 515-517.

To find out whether any significant problems have been overlooked in planning - the marketing program.<sup>18</sup>

The test market involves the use of a segment of the total market in the application of the test.<sup>19</sup>

To be effective in the field of product development, test marketing must improve as the rivalry between manufacturers comes to a sharper focal point and as new innovations are being introduced into the market. A firm must recognize that danger lies in placing new innovations in a test market by forewarning the competitor what to expect and by giving him ample time in which to produce a similar product.<sup>20</sup>

Whether succeeding or failing in its endeavors, a test market provides the manufacturer with positive results.<sup>21</sup> As one source reports:

Survival should contribute to greater profitability of the expanded operation through information and experience gained under actual marketing operations. In addition to enabling management to proceed with greater confidence and possibly to effect indicated revisions, a

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18 David J. Luck, Hugh G. Wales, and Donald A. Taylor, Marketing Research (Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1961), pp. 388-389, as quoted from E. J. Enright, "Market Testing," Harvard Business Review (September-October, 1958), p. 72.

19 Parker M. Holmes, Marketing Research Principles and Readings (Cincinnati, Ohio: Southwestern Publishing Company, 1966), pp. 225-231.

20 Taylor, op. cit., pp. 517-519.

21 Holmes, op. cit., p. 225.

successful test provides evidence to help "sell" the company's own organization and trade on the product.

When a test has negative results,<sup>22</sup> this is a small price to pay for a sound investment.

Test markets are usually used in conjunction with other types of product research.

### The Questionnaire

The questionnaire is probably the most common type of research used. A list of questions is generally mailed to consumers for them to answer and return.<sup>23</sup>

Many studies make it clear that the validity of the respondents' replies to a questionnaire depend on the kinds of questions asked as well as the circumstances under which they are asked.... To minimize the possibility of failure, some research men carefully follow a definite series of steps in questionnaire preparation. First, they draft a general outline of the subjects concerning which information is needed. To illustrate: Among other items, a study of the market for a proposed magazine might seek knowledge of reading habits, economic level of potential purchasers, and age groups to which the publication would appeal. These and other required areas of knowledge might be listed. Second, with the outline prepared, a number of people might be interviewed to determine their reactions. This process gives the researcher some appreciation of how those interviewed respond to various subjects contained in his outline, aids him in setting the order in which questions should be asked, indicates the best ways of phrasing questions, and, in general, provides him with the "feel" of the project. Third, the questionnaire is now drafted; and,

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22 Ibid., p. 231

23 Phillips, op. cit., p. 569.

fourth, pretested. The pretest usually consists of using the questionnaire on a small sample to be sure that all questions are understood, that the sequence and phrasing are satisfactory, that its length is manageable, and that the instructions to interviewers are clear and complete. Fifth, a final redrafting makes the questionnaire ready for final use.<sup>24</sup>

### Types of Questionnaires

Questionnaires fall into three categories: (1) mail, (2) personal interview, and (3) telephone.

Mail Questionnaire.--The mail questionnaire has a marked advantage over the other two types. It is able to reach a variety of more people for less cost, and the questions are asked in the same manner, thus eliminating bias upon the part of the interviewer.<sup>25</sup>

A survey can be conducted from any point where post-office facilities are available, and by one or more persons. Consequently, costly research organizations are unnecessary. Finally, when properly developed, the mail sample is highly reliable.<sup>26</sup>

Personal Interview.--When a questionnaire is used as a basis for personal interview, a greater number of questions may be included, and the sample is easier to control.

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24 Ibid., pp. 569-570.

25 Ibid., p. 570.

26 Ibid.

Telephone Interview.--As the name implies, the company hires people to call consumers on the telephone and have them respond to questions about a new product.<sup>27</sup>

#### Results of Questionnaires

By using questionnaires the manufacturer is able to gain first hand knowledge about the acceptance of a proposed product. It enables him to make a decision on whether or not to test the product further.

Now that the most important types of product testing have been explained, attention may be focused upon the most recent studies of each.

#### Analysis of the Types of Product Development

While statistics have shown that very few innovations are successful, new evidence has shown the market researcher that all is not as it seems.

For the last decade, speakers and writers on the subject have blithely observed that nine out of every 10 new products fail.... Now come the findings of a comprehensive study conducted by The Conference Board among 125 members of its senior marketing executives' panel.

The median percentage of failure in the marketplace among new products and services was slightly more than 20%---far short of the 90% myth.... Moreover, the figures are for products and services that "failed to meet expectations". Only<sup>28</sup> 5% bombed out so badly that they were taken off the market.

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27 Ibid., p. 571.

28 "New Product Payout", Marketing Communications, July 1971, p. 39.

Statistics have also been negligent by not showing which areas of product development were used on which product. There are both positive and negative attitudes in the four major areas of product development: concept testing, market testing, bench testing, and questionnaires.

### Concept Testing

The marketing manager encounters both positive and negative attributes in using concept testing. The industrial concern has a varied selection of methods of concept testing from which to choose in conducting its various tests.

While the manufacturer of a new product has various methods from which to choose, all point to one main advantage. This advantage is the ability of the manufacturer to take the preconceived ideas and concepts of the customer and produce a product which meets the expectations of the consumer, instead of developing a product which reflects ideas of the manufacturer.<sup>29</sup> As one authority has stated, the use of concept testing:

...is based on the notion, proven a pretty sound one, that consumers buy ideas rather than physical products. Each homemaker, for example, does not simply buy a box of cereal. She is buying what she anticipates a box of cereal will do for her; how it fits her goal as a mother and

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29 Taylor, op. cit., pp. 515-516.

her desire to provide the best possible nourishment for her family....<sup>30</sup>

Another important advantage of concept testing is the saving of time and financial outlays required in testing a product.<sup>31</sup> As James J. Albrecht, director of research and development for Coca Cola, stated:

The important point here is that before any laboratory work has begun, the marketing people had to ask themselves, "Who is our potential audience for such a product? How do we find them, what do we ask them and how do we interpret their results?" All of these are obvious questions. Maybe so, but we all know that many companies often begin to build a new product before taking an adequate look at the very difficult question, "Who or where is our market?"<sup>32</sup>

This type of concept testing is done through the use of consumer panels. The panels are asked to evaluate the new product.

Once we've isolated those bona fide customers, we ask them whether they think we are pursuing a worthwhile objective. If this small group of consumers seems to be happy with the idea of the product...then the last question we should ask ourselves is, "Are there enough of these people to make it worthwhile for us to go through all the technical development work and production work..."<sup>33</sup>

Along with the advantages of concept testing comes disadvantages. By using concept testing, management is running the risk

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30 Ibid., p. 515, as cited from Kenneth Ford, "Management Guide--Test Marketing", Printers Ink (August 27, 1965), p. 26.

31 E. B. Weiss, "Slash New Product Cost with Conceptual Testing", Marketing Insights (April 30, 1970), pp. 6-7.

32 Ibid., p. 6.

33 Ibid., p. 7.

of enabling a competitor to produce a like product.<sup>34</sup> Concept testing also fails to do other things, as one authority stated:

However, the method is not foolproof; for concept testing can only stimulate reality, and many of the forces and influences of the marketplace cannot be communicated in a concept description.<sup>35</sup>

Another pitfall in which management can become entangled is overreacting to consumer preference. An example of such is Ford's introduction of the Edsel. Here, Ford's top management gathered concepts of the consumer for a long period of time and when they finally introduced the product it failed mainly because the public had changed its ideas of what it actually wanted.<sup>36</sup>

As one source puts it:

The Edsel, nevertheless, is one of the most conspicuous new product failures in business history. The events leading up to the tragedy (or down to the comedy) are examined in this account. It can be argued that the decision to introduce the Edsel was one of the wisest decisions ever made by Ford Motor Company. This extreme position is the one defended. The story is one of a firm proceeding carefully and methodically, working within the context of an elaborate marketing plan, doing most things right,--and ending up with a total disaster.<sup>37</sup>

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34 Westing, op. cit., pp. 269-273.

35 Taylor, op. cit., p. 516.

36 William H. Reynolds, "The Edsel Ten Years Later," Marketing Insights (December 11, 1967), pp. 10-13.

37 Ibid., p. 10.

In a recent study of concept testing certain specific research problems were found to be evident among the practitioners of concept testing. These problems are:

(1) To review the procedures, formal and informal, utilized by marketing management to obtain information about consumer attitudes toward product concepts in the planning and premarket testing phases of new product development. These findings serve to identify and define the needs of management in this area and to provide a judgemental estimate of the variables involved.

(2) To formulate a product-concept testing model as a management decision-making tool. Its purpose is to serve as a procedural information system to provide management with a quantitative measure of consumer attitudes and preferences applicable to new product decisions.

(3) To conduct a pilot experiment to demonstrate and test the model in a new product development situation.<sup>38</sup>

It is evident that concept testing has both negative and positive attributes. However, it must be noted that concept testing is usually used in conjunction with test marketing.

### Test Marketing

Test marketing, like concept testing, has a positive and negative side. While many market researchers disagree as to the meaning of test marketing, they all agree that it has many advantages. The most important of these advantages is being able

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38 Kaplan, op. cit., pp. 1-2.

to gain first hand knowledge from the marketplace.<sup>39</sup>

As one source has stated:

Moreover, marketers often feel that there is an interdependence among the various elements in the marketing mix which can only be uncovered in the marketplace itself. It is for precisely these reasons that market testing has long been one of marketing management's favorite commercial tools, for unlike product and copy tests, it has been considered the most realistic means of testing an action.<sup>40</sup>

Another advantage gained from first hand knowledge is described in the following manner:

The "marketing program" includes more than the product itself. Also under test are the package, the distribution plans, the pricing, and the promotional strategies. The research design should plan to obtain data by which the element's success can be evaluated.<sup>41</sup>

To have an effective test market a firm must continually improve its product, and must further realize that by placing a product in a test area forewarns the competitor and enables him to take necessary steps which will diminish the advantage held by the testing firm.<sup>42</sup> Although practiced by many firms, test marketing has been subjected to criticism in recent years. A report from one source presents it in the following manner:

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<sup>39</sup> Kenneth Ford, "Management Guide--Test Marketing," Printers Ink, Vol. 291 (August 27, 1965), pp. 21-23.

<sup>40</sup> Ibid., p. 23.

<sup>41</sup> Luck, op. cit., p. 389.

<sup>42</sup> Taylor, op. cit., pp. 517-518.

There's growing doubt about the value of test marketing for consumer packaged goods. Practically no marketer or market researcher is happy with present procedures. But they can't agree on what to do about them. On the one hand, there's increasing and surprisingly strong resistance to any test marketing.<sup>43</sup> On the other hand, there is a call for even more detailed,<sup>44</sup> prolonged testing of all elements of a new product.

...It has long been an article of faith in the high-risk consumer goods field that you don't dare "go national" with a new product until it has been test marketed--usually in Albany, N. Y., Columbus, Ohio, or two or three other spots favored by researchers. It's supposed to be possible to project results from those markets to the entire country.<sup>45</sup> The problem today, though, is that there are too many new products being tested in those markets. The consumer knows it, too. Does this detract from the results?

Also, the manufacturers are now testing many more things than they did formerly, such as various sizes, various levels of advertising, expenditure, and various combinations of prices, sizes, and advertising. All this contributes to the difficulty of appraising results. In addition, every company has become very sophisticated in "jamming" a competitor's test with special promotions of its own products.<sup>46</sup>

You can leave the product in the test market long enough for the novelty to wear off and determine a true pattern of consumer use--but that's expensive. One authority says it

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43 Phillips, op. cit., p. 572, as quoted from "Test Marketing is Passé says Johnson's Duncan," Advertising Age (February 20, 1967), p. 1B; also quoted from D. K. Hardin, "A New Approach to Test Marketing," Journal of Marketing, Vol. XXX, No. 4 (October 1966), pp. 28-31.

44 Ibid., as quoted from Frank Stanton, "What is Wrong with Test Marketing?" Journal of Marketing, Vol. XXXI, No. 2 (April 1967), p. 47.

45 Ibid., as quoted from Alvin Achenbaum, Research Director, Grey Advertising Inc., in Kenneth Ford, "Test Marketing," Printers Ink (August 27, 1965), p. 27.

46 Ibid., p. 573, as quoted from Ted Stanton, "Figures Don't Lie? Test Market Results Are Clouded by 'Spoiler' Tactics of Competitors," Wall Street Journal (May 24, 1966), pp. 1, 19.

costs \$500,000 to introduce a new brand into a test market and maintain it there for a year. You can employ more refined statistical methods to filter out competitive jamming and get a result better suited to projection.

Neither of these procedures is a real solution to the test market problem, many experts say. The longer a product remains in test market, the easier it is for competition to duplicate it. Competitors can now catch up so fast that marketers are growing reluctant to introduce anything on a test basis.

One way out is extensive panel testing--perhaps even some computer simulation--before putting the product in test market. The idea is to keep the product there only a brief time to get answers to such specific questions as: Will the product sell at all?

Another procedure finding favor looks like test marketing, but isn't. A product is introduced into a single market where sales can be substantial enough to produce profit in that market alone. When that profit level is achieved, a new market is opened and developed. If a competitor duplicates the product, at least some profits have been extracted in the first market.<sup>47</sup>

It is evident that marketers have found the use of test markets to be positive and negative in nature with the controversy over test marketing far from over.

### Bench Testing

The nature of bench testing is composed of both positive and negative forces. The results from a bench test aid the manufacturer in the following manner:

First, an estimate may be made of what the volume possibilities may be if the product is made and sold in a mass market; and second, some information may be gained on improve-

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<sup>47</sup> Ibid., as quoted from "Marketing Outlook," Business Week (March 4, 1967), p. 90.

ments that might be made in the product before it is placed on the market.<sup>48</sup>

On the other side of the board, it was discovered that bench testing can be inadequate and costly. As one source describes it:

The causes of failure of a new product did not vary from one industry to another.... The most common was "inadequate market analysis". This included both poor research and lack of research...

The second most common cause of failure--"product problems or defects".... Unexpected mechanical or production problems may require adjustments that compromise the quality of the product.<sup>49</sup>

Bench testing, like its predecessors, test markets and concept testing, has both positive and negative attributes. It should be noted that bench testing is used in conjunction with test markets and is usually not used by itself for establishing product standards.

### Questionnaires

As was discussed earlier, questionnaires are divided into three categories, each having positive and negative attributes.

#### Mail Questionnaires

Mail questionnaires have certain important attributes. As one source has described it:

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48 Taylor, op. cit., p. 517.

49 "New Product Payout," Marketing Communications (July 1971), p. 38.

Widely scattered people may be reached with less cost than by an interviewer. The researcher can be sure that the questions are asked in the same manner of all those from whom replies are sought, thereby minimizing interviewer bias.... Its anonymous nature encourages replies to personal questions related to age, income, and education.<sup>50</sup>

However, with advantages come disadvantages. The same source states:

Experience has made it clear that the mailed questionnaire is frequently a slow method of gathering data, since many persons may delay returning it, fewer questions can be asked, and it is more difficult to control the individuals responding to it.... It is relatively easy for bias to arise from the order in which the questions are presented.<sup>51</sup>

#### Personal Interviews and Telephone Questionnaires

The main advantage of using personal interviews and telephone questionnaires is that they are able to ask more questions to help produce a valid sample. They are also flexible and fast in nature. However, it should be noted that by using these methods, bias of the interviewer is introduced into the sample. These two methods are also the most costly of the questionnaires.<sup>52</sup> As one authority describes it:

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50 Phillips, op. cit., p. 570.

51 Ibid.

52 Ibid., pp. 570-571.

However, since it is essential that the sample is representative and that the interviews are carried on in a scientific manner, problems of the determination of the sample and of personal bias on the part of interviewers are encountered.<sup>53</sup>

Evidence has shown that all types of product testing have both positive and negative qualities. Researchers also agree that until a better method is devised, those mentioned earlier in this chapter will have to suffice the manufacturer.

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53 Ibid., p. 570.

## CHAPTER III

### RESEARCH METHODS AND FINDINGS

#### Methods

##### The Data Collection Instrument

The survey questionnaire used in this investigation was designed to acquire data from national paint manufacturers (see Appendix A). The five questions were constructed to obtain information concerning the use of product development in the paint industry. The questionnaire investigated several aspects of product development. These aspects were: (1) the importance of the particular test or tests used; (2) the importance of the reliability and precision of the test used; (3) the importance of the cost of the program; and (4) the amount of time involved in completing the test.

##### Source of Data

Data for this investigation was collected from twenty-four national paint manufacturers. The sample was comprised of both large and small paint industries representing all geographical areas of the continental United States. These twenty-four

respondents comprised a sixty-one percent sample of the thirty-nine manufacturers contacted (see Appendix B).

#### Data Collection Procedures

A letter of introduction and a questionnaire were mailed to thirty-nine paint manufacturers. A short explanation was included in the questionnaire to assure accuracy of the answers. The first mailing took place on September 28, 1971, with nineteen questionnaires being returned. A follow-up questionnaire was sent to the remaining twenty industries on November 26, 1971, with five questionnaires being completed.

#### Treatment of Data

Due to the nature of the questionnaire, all questions have been put in table form. These tables show the number and percent of paint manufacturer responses to the categories listed in the table. Question Five has been evaluated in a general way due to the fact that those manufacturers who did answer answered in different manners.

#### Geographic Location

Of the twenty-four respondents all indicated that their respective companies used some type of product testing in their product development program. Six of the respondents are located on the East Coast. Eight more are located in the midwest portion of the United States. Six of the respondents are located in the

South and Southwest, and the final four are located on the West Coast.

It is apparent from this information that the sample will reflect a cross-section of the country.

Presentation of Findings

Types of Tests Used in Product Development

Tests Which Are Considered Very Important

TABLE 1

RESPONSES OF PAINT MANUFACTURERS AS TO THE IMPORTANCE OF SELECTED TYPES OF TESTS USED IN PRODUCT DEVELOPMENT IN THE PAINT INDUSTRY\*

TYPE OF TEST USED	VERY IMPORTANT	
	Number	Percent
Concept Testing	9	37.5
Test Market	10	41.7
Bench Testing	14	58.3
Questionnaire	3	15.0
Other	3	15.0

\* Based on twenty-four respondents

Table 1 shows that 37.5 percent, or 9 paint manufacturers, feel that concept testing is very important. An additional 41.7 percent, or 10 paint industries, feel that test marketing is very important. Another 58.3 percent, or 14 paint manufacturers, feel that bench testing is very important. Only 15 percent, or 3 paint manufacturers, feel that the questionnaire or some other type of testing is very important.

#### Tests Which Are Considered Important

TABLE 2  
RESPONSES OF PAINT MANUFACTURERS AS TO THE  
IMPORTANCE OF SELECTED TYPES OF TESTS  
USED IN PRODUCT DEVELOPMENT IN  
THE PAINT INDUSTRY\*

TYPE OF TEST USED	IMPORTANT	
	Number	Percent
Concept Testing	5	20.8
Test Market	9	37.5
Bench Testing	6	25.0
Questionnaire	4	16.7

\* Based on twenty-four respondents

Table 2 shows that 20.8 percent, or 5 paint manufacturers, indicated that concept testing was important in their industry.

An additional 37.5 percent, or 9 paint industries, feel that test marketing is important. Twenty-five percent, or 6 paint industries, also feel that bench testing is important. The remaining 16.7 percent, or 4 paint industries, feel that questionnaires are important to their industry.

#### Tests Which Are Considered Slightly Important

TABLE 3  
RESPONSES OF PAINT MANUFACTURERS AS TO THE  
IMPORTANCE OF SELECTED TYPES OF TESTS  
USED IN PRODUCT DEVELOPMENT IN  
THE PAINT INDUSTRY\*

TYPE OF TEST USED	SLIGHTLY IMPORTANT	
	Number	Percent
Concept Testing	3	15.0
Test Market	2	8.3
Bench Testing	1	4.1
Questionnaire	5	20.8

\* Based on twenty-four respondents

Table 3 indicates that 15.0 percent, or 3 paint industries, feel that concept testing is slightly important. Eight and three-tenths percent, or 2 paint industries, have indicated that test markets are slightly important in their program. An additional 4.1 percent, or 1 paint industry, feels that bench

testing is slightly important. The remaining 20.8 percent, or 5 paint industries, have indicated that questionnaires have slight importance to them.

#### Tests Which Are Considered Not Important

TABLE 4  
RESPONSES OF PAINT MANUFACTURERS AS TO THE  
IMPORTANCE OF SELECTED TYPES OF TESTS  
USED IN PRODUCT DEVELOPMENT IN  
THE PAINT INDUSTRY\*

TYPE OF TEST USED	NOT IMPORTANT	
	Number	Percent
Concept Testing	4	16.7
Test Market	1	4.1
Bench Testing	0	0
Questionnaire	9	37.5
Other	1	4.1

\* Based on twenty-four respondents

Table 4 shows that 16.7 percent, or 4 paint industries indicate that concept testing is not important to them. An additional 4.1 percent, or one industry, feels that test markets are not important. All industries felt that bench testing had some importance. An additional 37.5 percent, or 9 paint indus-

tries, feel that questionnaires are not important. The remaining 4.1 percent, or one industry, feels some other type of testing is not important.

The Importance of Time, Costs, and Precision

Time, Precision, and Costs Considered Very Important

TABLE 5

RESPONSES OF PAINT MANUFACTURERS AS TO THE IMPORTANCE OF THE COST, TIME, RELIABILITY, AND PRECISION INVOLVED IN THE PRODUCT DEVELOPMENT PROGRAM IN THE PAINT INDUSTRY\*

	VERY IMPORTANT	
	Number	Percent
The Cost of the Program	13	54.1
Time Involved	11	45.8
Reliability and Precision	10	41.7

\* Based on twenty-four respondents

Table 5 indicates that 54.1 percent, or 13 paint manufacturers, feel that the cost of the development program is very important. An additional 45.8 percent, or 11 paint producers, feel that the time required to run a developmental program is very important. A final 41.7 percent, or 10 paint manufacturers,

feel that reliability and precision of a product development program is very important.

Time, Precision, and Costs Considered Important

TABLE 6

RESPONSES OF PAINT MANUFACTURERS AS TO THE IMPORTANCE OF THE COST, TIME, RELIABILITY, AND PRECISION INVOLVED IN THE PRODUCT DEVELOPMENT PROGRAM IN THE PAINT INDUSTRY\*

	IMPORTANT	
	Number	Percent
The Cost of the Program	8	33.3
Time Involved	9	37.5
Reliability and Precision	9	37.5

\* Based on twenty-four respondents

Table 6 shows that 33.3 percent, or 8 manufacturers of paint, feel that the cost of the program plays an important role in product development. An additional 37.5 percent, or 9 manufacturers, feel that the time involved in a development program is important to a firm. A final 37.5 percent, or 9 manufacturers, feel that reliability and precision are important to their respective firms.

Time, Precision, and Costs Considered Slightly Important

TABLE 7

RESPONSES OF PAINT MANUFACTURERS AS TO THE IMPORTANCE  
OF THE COST, TIME, RELIABILITY, AND PRECISION  
INVOLVED IN THE PRODUCT DEVELOPMENT  
PROGRAM IN THE PAINT INDUSTRY\*

	SLIGHTLY IMPORTANT	
	Number	Percent
The Cost of the Program	1	4.1
Time Involved	2	8.3
Reliability and Precision	3	15.0

\* Based on twenty-four respondents

Table 7 indicates that 4.1 percent, or 1 paint industry, feels that the cost of the program is slightly important. Another 8.3 percent, or 2 paint industries, indicate that they feel the time involved in a developmental program is of slight importance. A final 15.0 percent, or 3 manufacturers, feel that reliability and precision is of slight importance.

All respondents indicated that the cost, time involved, and reliability and precision of the developmental program had some type of importance to their particular firm (see Appendix C, Table II).

The Use of Various Methods of Product Development  
Exclusively or in Different Combinations

Table 8 indicates that 15.0 percent, or 3 paint manufacturers, use test markets as an exclusive test of new products in their respective firms. An additional 8.3 percent, or two industries, use bench testing exclusively in their developmental programs. Of the twenty-four respondents, only 5 industries, or 23.3 percent, used any of the four methods exclusively.

Of the twenty-four respondents, 22 paint industries, or 91.3 percent, used combinations of the four methods. Twenty-five percent, or 6 paint industries, indicated that they use a combination of test markets and bench testing in their product development program. Five industries, 20.8 percent, used a combination of concept testing, bench testing, test markets, and questionnaires. Another 20.8 percent, or 5 industries, indicated that they used a combination of concept testing, test markets, and bench testing in their developmental programs. Other combinations of methods, which 4.1 percent, or one industry, indicated they use are: (1) concept test and test markets; (2) concept test and questionnaires; (3) concept tests, bench tests, and questionnaires; and (4) test markets and questionnaires. A final 8.3 percent, or two industries, indicate that they use a combination of concept test and bench testing in their product development program.

TABLE 8

RESPONSES OF PAINT MANUFACTURERS AS TO THE  
IMPORTANCE OF USING THE VARIOUS METHODS  
OF PRODUCT DEVELOPMENT EXCLUSIVELY  
OR IN DIFFERENT COMBINATIONS\*

	EXCLUSIVELY		COMBINATIONS	
	No.	%	No.	%
Concept Test and Test Market			1	4.1
Concept Test and Bench Test			2	8.3
Concept Test and Questionnaire			1	4.1
Concept Test, Test Market, and Bench Test			5	20.8
Concept Test, Test Market, and Questionnaire				
Concept Test, Bench Test, and Questionnaire			1	4.1
Concept Test, Bench Test, Test Market, and Questionnaire			5	20.8
Test Market and Bench Test			6	25.0
Test Market and Questionnaire			1	4.1
Test Market, Bench Test, and Questionnaire				
Bench Test and Questionnaire				
Concept Test				
Test Market	3	15.0		
Bench Test	2	8.3		
Questionnaire				

\* Based on twenty-four respondents

The Average Amount of Time Spent on a Test Product  
Before It Is Put on the Market

Table 9 shows that 45.8 percent, or 11 paint producers, feel that the average amount of time which should be spent on a program is from six months to one year. An additional 25.0 percent, or 6 industries, feel that the average time needed to complete a program is one to two years. Sixteen and seven-tenths percent, or 4 paint industries, feel that the time involved in a program should be from three to six months. Four and one-tenth percent, or 1 industry, feels that a development program should run three months or less. A final 4.1 percent, or 1 industry, feels that some other length of time is necessary for product development in its firm.

TABLE 9

RESPONSES OF PAINT MANUFACTURERS AS TO THE IMPORTANCE OF  
THE AVERAGE AMOUNT OF TIME SPENT ON A TEST MARKET  
BEFORE IT IS PUT ON THE MARKET OR  
DELETED FROM THE PROGRAM\*

TIME INVOLVED IN THE TEST OF A PRODUCT	NUMBER	PERCENTAGE
0-3 months	1	4.1
3-6 months	4	16.7
6 months - 1 year	11	45.8
1 year - 2 years	6	25.0
Other	1	4.1

\* Based on twenty-four respondents

### Related Studies on Product Development

A recent study conducted by Leonard Kaplan<sup>1</sup> deals with product-concept testing. His definition of product-concept testing is:

Product-concept testing is a procedure designed to provide information about consumer attitudes toward proposed product concepts before the actual production of the product. It is a pre-market testing activity of management to help fulfill the "marketing concept" whereby new products are designed to satisfy consumer needs, wants, and desires.<sup>2</sup>

Leonard Kaplan concludes his study with a product-concept testing model and states his findings in the following manner:

The research findings of this investigation indicated that the use testing of attributes to be built into a new product is an important requirement for consumer oriented research. On the basis of understanding of the product concepts and how consumers view these concepts, the new product can be developed. Properly defined consumer data can provide management with the guidelines and controls for execution of the new product program....

The implications of the results of the pilot experiment are important considerations for new product research. The data suggest that conceptual attitude testing alone, cannot be depended upon for decisions on new product attributes. It is necessary that laboratory scale prototype products be evaluated in subsequent product-use tests to obtain measures of consumer preferences toward product alternatives, these preferences thus serving as statistically assessable validation criteria. The findings of the experiment indicated that attitudes toward alternative concepts are not necessarily correlated with the subsequent use test preferences. The model procedure takes this consideration into account by

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1 Kaplan, op. cit., p. 2.

2 Ibid. pp. 3-4.

including use tests as an intrinsic part of the operation. The attitude data may be useful by providing guidelines for the laboratory preparation of the prototype products. Validation of these attitudinal data by the use test preferences serves as the "go-ahead" signal for production of the attribute quality to be built into the test marketed product, based on consumer research rather than arbitrary management decision. In the event that the use test preferences do not validate the attitudinal data, management has the signal that a modification of the proposed product is in order, and that perhaps a restatement of the new product problem is required. Thus, the model provides a closed-loop feedback system, to aid in reducing some of the risk due to uncertainty in new product development before considerable investments in product production and market testing have been committed.<sup>3</sup>

Masso Nakanishi conducted a study on the reaction of the consumer to a new product in relation to the marketer's action of introduction of the new innovation.<sup>4</sup> His findings are as follows:

...First, it pointed out the differences between the classical adoption process concept and the acceptance process of a new product when the product in question is not an innovation as such, and suggested that a more meaningful analysis of the acceptance process could be performed by separating its major behavioral components and examining the characteristics of each component in detail. Second, this study adopted a mathematical specification....<sup>5</sup>

One last study was investigated, this being conducted by James T. Rothe on product elimination.<sup>6</sup> Rothe's conclusions are as follows:

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3 Ibid., pp. 133-135.

4 Nakanishi, op. cit., p. 3.

5 Ibid., p. 214.

6 Rothe, op. cit., pp. 180-181.

The type of product elimination procedure which a firm should use will be related to that particular firm's needs and abilities. It would be difficult to develop "one program" for all companies to use. However, from the background research done for this study and from the results of the study itself, it seems appropriate to suggest that any effective product elimination program must have three distinct parts which should be viewed in a sequential manner. These are: the recognition of weak products, the analysis of those weak products, and a phase-out program for the products which are to be eliminated.<sup>7</sup>

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7 Ibid.

## CHAPTER IV

### SUMMARY, ANALYSIS, AND CONCLUSIONS

#### Summary

Chapter I stated that the primary purpose of this investigation was to study product development programs used by paint industries today. Answers to the following specific questions regarding national paint industries were obtained from a survey questionnaire:

1. Exactly how important are the four basic types of testing - concept testing, test marketing, bench testing, and questionnaires - to the product development program?
2. How important is the cost of the program to a company?
3. How important is time to the product development program?
4. Do reliability and precision play an important role in the development program?
5. What is the average length of time involved in the development program?

The primary research evaluated the use of product development by twenty-four national paint industries. The nature of the

tests, the program cost, the reliability and precision of the tests, and the amount of time involved were measured for their importance.

Chapter II noted that marketers feel there are four major types of product development: concept testing, bench testing, test markets, and questionnaires. A manufacturer is able to use one or a combination of these to test his product. While some manufacturers use only one particular type of test, evidence showed that all types of product testing are interrelated to one another and complement one another. Chapter II also noted that the four major types of testing are usually used in conjunction to one another in the development of a product.

Chapter III presented a survey questionnaire to measure the importance of the four major types of product development, the importance of the program cost, the importance of reliability and precision of the test, the importance of the time involved in conducting a test, and the length of time needed to test a product. National paint industries were asked to respond to these questions. The paint industries contacted cover all geographic areas of the continental United States and are comprised of both large and small industries.

Twenty-four paint industries completed and returned the questionnaire. All completed questionnaires were usable.

The data derived from the questionnaires was arranged in

tabular form. The tables show the number and percent of paint manufacturer responses to the divisions listed in the tables. The increasing need and demand for protection and beauty of building materials is such a dimension. Paint industries are continuing to give the consumer better products daily. As long as man exists, there will be buildings and a need for paint and paint by-products.

### Analysis of Findings

#### Geographic Location

Industry responses to the questionnaire indicated that they all used product testing in their respective product development programs. Six of the respondents are located on the East Coast. Eight more are located in the midwest portion of the United States. Six of the respondents are located in the South and Southwest, and the final four are located on the West Coast.

#### Types of Test Used in Product Development

Industry responses on the questionnaire regarding its classification of the four major testing methods as to their importance substantiates the literature in three major areas. First, approximately eighty-four percent of the respondents indicated they felt bench testing was very important or important. Second, over seventy-nine percent felt that test marketing was very important or important. Third, approximately fifty percent felt

that concept testing was very important or important.

Paint industry responses differed in one major area from the marketing literature. The use of questionnaires as being an important test did not hold true. Only fifteen percent of the respondents felt questionnaires to be very important, while approximately thirty-eight percent felt they were not important.

#### The Importance of Time, Cost, and Precision

The majority of those paint industries responding to the questionnaire felt that time, cost, and precision had some importance in the developmental program. Eighty-seven percent of the respondents felt that the cost of the developmental program was very important or important. Over eighty-three percent felt that the time involved in conducting a developmental program was very important or important. Seventy-nine percent of the respondents indicated that the reliability and precision of the tests being used in the developmental program was very important or important.

#### The Use of Various Methods of Product Development Exclusively or in Different Combinations

Paint industry responses on the questionnaire substantiate the literature concerning the use of various methods of product development in all areas of product testing. Of the twenty-four respondents, over ninety-one percent used combinations of the four major methods of product development. Those combinations which

are of the most importance lie in the following areas:

1. test markets and bench testing - twenty-five percent;
2. concept testing, bench testing, and test markets - approximately twenty-one percent;
3. concept testing, bench testing, test markets, and questionnaires - approximately twenty-one percent.

Only fifteen percent of the respondents felt that they should use test markets exclusively; another eight percent wished to use bench testing exclusively.

The Average Amount of Time Spent on a Test Product Before It Is Put on the Market

Paint industry responses as to the average length of time spent on a product indicate that approximately eighty-eight percent felt that the average length of time fell between three months and two years. This may be broken down further in the following manner:

1. three to six months - approximately seventeen percent;
2. six months to one year - approximately forty-six percent;
3. one to two years - twenty-five percent.

### Conclusions

Based on the preceding analysis, the following conclusions may be drawn about product development in the paint industry:

1. The majority of paint industries consider bench testing, test markets, and concept testing to be very important in the developmental stages of a product. This coincides with the literature dealing in these three areas. Also, it should be mentioned that this conclusion bears out the related studies dealing with concept testing.

2. The majority of paint industries do not consider the questionnaire a valid test in the product development program.

3. Bearing out the evidence in the literature chapter, the majority of the paint industries consider the cost of the program, the time involved, and the reliability and precision of a developmental program to be very important.

4. The majority of paint industries consider six months to one year as being the average length of time for a product development program.

5. Also agreeing with the literature, the paint industries use a combination or combinations of the four major testing methods. It should be noted that this conclusion coincides with the related study dealing with product elimination.

## APPENDIXES

APPENDIX A

The Questionnaire

QUESTIONNAIRE ON PRODUCT DEVELOPMENT  
IN THE PAINT INDUSTRY

The questions below pertain to product development in the paint industry and can be completed by checking the appropriate blank or square. For the purpose of this study, we will consider the following procedures in product development which are dominant in marketing literature:

(1) Concept Testing -- is considered as a complete and graphic description of a product which provides a means of reaction from a representative panel of consumers.

(2) Bench Testing -- is a working model of the product being tested for performance.

(3) Test Markets -- involve the selection of a small part of the total market for the conduction of certain tests.

(4) Questionnaires -- consist of a list of questions generally mailed to the consumer for his reaction to a proposed product.

1. Please rate each of the following testing procedures according to their importance in product development.

Type	Very Important	Important	Slightly Important	Not Important
Concept Testing				
Test Market				
Bench Testing				
*Questionnaires				
Other (specify)				

\*For the purpose of this study, questionnaires should include the following: (a) mail questionnaires, (b) personal interviews, and (c) telephone questionnaires.

2. How do you rate the following when deciding what procedure to use in your product development program?

	Very Important	Important	Slightly Important	Not Important
The Cost of the Program				
Time Involved				
Reliability and Precision of Test				

3. Please rate each of the following types of testing procedures as to their use in the program:

Use	Concept Test	Test Market	Bench Test	Questionnaire
Exclusively				
*Combination				

\*If combinations are used, please check (✓) the different combinations.

4. What is the average amount of time spent on a test product before it is put on the market or scrapped?

\_\_\_\_\_ 0-3 months  
 \_\_\_\_\_ 3-6 months  
 \_\_\_\_\_ 6 months - 1 year  
 \_\_\_\_\_ 1 year - 2 years  
 \_\_\_\_\_ other (specify)

5. Any further comments you may have on product development will be appreciated:

APPENDIX B

National Paint Industries

## APPENDIX B

NATIONAL PAINT INDUSTRIES CONTACTED BY QUESTIONNAIRE  
FOR THE PURPOSE OF THIS STUDY

Baltimore Paint and Chemical Corporation  
2235 Hollins Ferry Road  
Baltimore, Maryland 21230

Carboline Company  
328 Hanley Industrial Court  
St. Louis, Missouri 63144

Celanese Corporation  
522 Fifth Avenue  
New York, New York 10036

Concnemo Inc.  
18th and Garfield Sts.  
Kansas City, Missouri 64127

Cook Paint Company  
P. O. Box 389  
Kansas City, Missouri 64141

DeSoto Inc.  
1700 South Mt. Prospect Road  
Des Plaines, Illinois 60018

National Industries Inc.  
510 West Broadway  
Louisville, Kentucky 40202

Dixon Crucible Company  
167 Wayne Street  
Jersey City, New Jersey 07303

Dupont de Nemours  
1007 Market Street  
Wilmington, Delaware 19898

Grow Chemical Corporation  
345 Park Avenue  
New York, New York 10017

Guardsman Chemical Coatings Inc.  
1350 Steele Avenue, S. W.  
Grand Rapids, Michigan

Inmont Corporation  
1133 Avenue of the Americas  
New York, New York 10036

Lilly Industrial Coatings Inc.  
666 South California Street  
Indianapolis, Indiana 46225

National Chemsearch Corporation  
2730 Carl Road  
P. O. Box 217  
Irving, Texas 75060

PPG Industries Inc.  
One Gateway Center  
Pittsburgh, Pennsylvania 15222

Pratt and Lambert Inc.  
75 Tonawanda Street  
Buffalo, New York 14240

Seagrave Corporation  
350 Fifth Avenue  
New York, New York 10001

Reliance Universal, Inc.  
Suite 300, Nolan Bldg.  
2100 Gardner Lane  
Louisville, Kentucky 40205

Sherwin-Williams Company of Canada, Limited  
2875 Centere Street  
Montreal 104, Quebec, Canada

Standard Brands Paint Company  
4300 West 190th Street  
Torrance, California

Tremco Manufacturing Company  
10701 Shaker Blvd.  
Cleveland, Ohio

Valspar Corporation  
220 Sayre Street  
Rockford, Illinois 61101

James Bute Company  
711 William Street  
Houston, Texas 77001

The A and H Paint Company  
472 S. Brehl Avenue  
Columbus, Ohio 43216

Ace Paints Products Company  
2622 West Sunnyside Avenue  
Chicago, Illinois 60625

Acme Quality Paints  
8250 St. Aubin Avenue  
Detroit, Michigan 482111

American Home Paint Company, Inc.  
568-586 Grand Avenue  
Detroit, Michigan 48211

Ameritone Paint Corporation  
18414 S. Santa Fe Avenue  
Compton, California 90221

Blatz Paint Company  
319 S. Shelby Street  
Louisville, Kentucky 40202

The Bolce Paint Company  
4011 Red Band Road  
Cincinnati, Ohio 45227

Samuel Cabot, Inc.  
No. 1 Union Street  
Boston, Massachusetts 02108

Capitol Paint and Varnish Works Inc.  
4828 S. Hoyne Avenue  
Chicago, Illinois 60609

Charles Research Inc.  
2401 East 85th Street  
Kansas City, Missouri 64132

The Yenkin-Majestic Paint Corporation  
1920 Leonard Avenue  
Columbus, Ohio 43219

U. S. Paint, Lacquer, and Chemical Company  
2115 Singleton Street  
St. Louis, Missouri 63103

United Paint Manufacturing Company, Inc.  
1130 E. Sprague Avenue  
Spokane, Washington 99202

S. E. B. Paint Company, Inc.  
115 N. E. 10th Street  
Oklahoma City, Oklahoma 73104

Tom Sawyer Paints Inc.  
Rt. 5, 812 New Jesup Highway  
Brunswick, Georgia 31520

The Martin-Senour Company  
2500 S. Senour Avenue  
Chicago, Illinois 60608

APPENDIX C

Reference Tables

TABLE I  
 RESPONSES OF PAINT MANUFACTURERS AS TO THE  
 IMPORTANCE OF SELECTED TYPES OF TESTS  
 USED IN PRODUCT DEVELOPMENT IN  
 THE PAINT INDUSTRY\*

TYPE OF TEST USED	VERY IMPORTANT		IMPORTANT		SLIGHTLY IMPORTANT		NOT IMPORTANT	
	No.	%	No.	%	No.	%	No.	%
Concept Testing	9	37.5	5	20.8	3	15.0	4	16.7
Test Market	10	41.7	9	37.5	2	8.3	1	4.1
Bench Testing	14	58.3	6	25.0	1	4.1	0	0
Questionnaire	3	15.0	4	16.7	5	20.8	9	37.5
Other	3	15.0	0	0	0	0	1	4.1

\* Based on twenty-four respondents

TABLE II

RESPONSES OF PAINT MANUFACTURERS AS TO THE IMPORTANCE  
OF THE COST, TIME, RELIABILITY, AND PRECISION  
INVOLVED IN THE PRODUCT DEVELOPMENT  
PROGRAM IN THE PAINT INDUSTRY\*

	VERY IMPORTANT		IMPORTANT		SLIGHTLY IMPORTANT		NOT IMPORTANT	
	No.	%	No.	%	No.	%	No.	%
The Cost of the Program	13	54.1	8	33.3	1	4.1	0	0
Time Involved	11	45.8	9	37.5	2	8.3	0	0
Reliability and Precision	10	41.7	9	37.5	3	15.0	0	0

\* Based on twenty-four respondents

TABLE III

RESPONSES OF PAINT MANUFACTURERS AS TO THE  
IMPORTANCE OF USING THE VARIOUS METHODS  
OF PRODUCT DEVELOPMENT EXCLUSIVELY  
OR IN DIFFERENT COMBINATIONS\*

	EXCLUSIVELY		COMBINATIONS	
	No.	%	No.	%
Concept Test and Test Market			1	4.1
Concept Test and Bench Test			2	8.3
Concept Test and Questionnaire			1	4.1
Concept Test, Test Market, and Bench Test			5	20.8
Concept Test, Test Market, and Questionnaire				
Concept Test, Bench Test, and Questionnaire			1	4.1
Concept Test, Bench Test, Test Market, and Questionnaire			5	20.8
Test Market and Bench Test			6	25.0
Test Market and Questionnaire			1	4.1
Test Market, Bench Test, and Questionnaire				
Bench Test and Questionnaire				
Concept				
Test Market	3	15.0		
Bench Test	2	8.3		
Questionnaire				

\* Based on twenty-four respondents

TABLE IV

RESPONSES OF PAINT MANUFACTURERS AS TO THE IMPORTANCE OF  
 THE AVERAGE AMOUNT OF TIME SPENT ON A TEST MARKET  
 BEFORE IT IS PUT ON THE MARKET OR  
 DELETED FROM THE PROGRAM\*

TIME INVOLVED IN THE TEST OF A PRODUCT	NUMBER	PERCENTAGE
0-3 months	1	4.1
3-6 months	4	16.7
6 months - 1 year	11	45.8
1 year - 2 years	6	25.0
Other	1	4.1

\* Based on twenty-four respondents

## BIBLIOGRAPHY

### Books

- HANSEN, Harry L. Marketing Text, Techniques, and Cases. Homewood, Illinois: Richard D. Irwin, Inc., 1967.
- HOLMES, Parker M. Marketing Research Principles and Readings. Cincinnati, Ohio: Southwestern Publishing Company, 1966.
- LUCK, David J., Hugh G. Wales, and Donald A. Taylor. Marketing Research. Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1968.
- PHILLIPS, Charles F. and Delbert J. Duncan. Marketing Principles and Methods. Homewood, Illinois: Richard D. Irwin, Inc., 1969.
- TAYLOR, Weldon J. and Roy T. Shaw, Jr. Marketing: An Integrated, Analytical Approach. Cincinnati, Ohio: Southwestern Publishing Co., 1969.
- WESTING, J. Howard and Gerald Albaum. Modern Marketing Thought. New York: The Macmillan Company, 1969.

### Periodicals

- FORD, Kenneth. "Management Guide--Test Marketing," Printers Ink, Vol. 291 (August 27, 1965).
- "New Products Payout," Marketing Communications (July 1971).
- REYNOLDS, William H. "The Edsel Ten Years Later," Marketing Insights (April 30, 1970).

Unpublished Works

KAPLAN, Leonard. "Product-Concept Testing in New Product Development". Unpublished Ph. D. dissertation, New York University, 1968.

NAKANISHI, Masao. "A Model of Market Reaction to New Products". Unpublished Ph. D. dissertation, University of California, Los Angeles, 1968.

ROTHER, James T. "An Empirical Investigation of the Product Elimination Decision". Unpublished Ph. D. dissertation University of Wisconsin, 1969.