

Abstract

This article examines the role of market research in design and technology as part of the design process. Moreover, a sample structure is given to help shape the content of what is required when one is conducting market research. The intention is to help staff and students to develop a better understanding on the role of market research when designing new products.

Introduction

The primary intention of this article is to broaden and intensify the role of market research in design and technology by drawing attention to the following issues. The article is divided into five phases. The first phase defines market research and how students can utilise it in their research. The second part examines the importance of doing market research. The third phase investigates the possible variables affecting human needs and wants, whereas the fourth phase explores the criteria used for market selection when a student designer intends to develop a new product. The fifth part focuses on a series of possible reasons why products fail in the market. This article concludes by arguing that market research is a component of the design process and if it is omitted, the process would be incomplete and it could lead to a product, which might not sell in the market.

If market research is treated as part of the design process, obviously students would be compelled to carry out research. Design problems should be posed as themes, for example, 'storage'. This gives student designers greater flexibility to research on many areas of interest. Before any meaningful design work can be done, student designers should be encouraged to go out and meet their prospective customers so that they get first hand information about their needs. This obviously leaves no room for assumptions during the design stage. In all however, market research should be treated as the next immediate stage after the design problem has been identified in the design process.

Defining market research

Perhaps the marketing concept can be seen in the writings of Adam Smith when he echoed that, 'the consumer has sovereignty or the consumer is king'. (Leader and Kyritsis, 1992: 2) In other words, a student designer should first discover what potential customers wish to purchase and how much they are willing to pay for a particular product. The student designer can then determine if the desired product can be produced and sold at a price customers will pay and at a profit to him or her. It is in essence a simple concept. For one to be an

effective student designer, the design process must start off in the right direction, otherwise the design will finish badly or at least chaotically. To achieve this, the real voice of the customer must be established. In support of the previous statement, Whiteley (1993: 67) noted that, 'the designer needs to place the customer centrally in the company's thinking'.

Furthermore,

'For the outcomes (product) to be successful they must address the voice of the customer, whenever or whoever he or she may be. And they must do this before the research commences and continue to interface and communicate with the voice of the customer during the evolution of the research.' (Pugh, 1997: 29)

The real voice of the customer becomes visible and established only by these two ways:

1. Student designers in the course of their everyday duties can gather information informally and subconsciously, by observing, listening to discussion, and talking to colleagues in industry and reading trade or other journals and papers. Bicknell and Mc Quiston suggested this to student designers:

'Go and live with the people. Work with them and then see what you can do to help. If you try to help from outside you are unlikely to succeed and may inadvertently do more harm than good.' (1997: 93)

To sum up the above sentiments using Hung's words,

'You have to go out and take a careful, analytic look at where the product will be used and what the user normally does there. That means going into people's homes or places of work. Quietly observing, but also actively questioning, about habits, problems, expectations and wishes.'

2. The above process should be supported by more formal procedures carried out in a systematic and scientific way. This could be achieved by market research. Leader and Kyritsis have equated market research to 'the planned and systematic gathering and collation of data and the analysis of information relating to all aspects of marketing and the final consumption.' (1989: 69)

On the other hand, Chisnall quoted the Market Research Society by saying, 'Market research is the means used by those who provide goods and services to keep themselves in touch with the needs and wants of those who buy and use those goods and services.' (1992: 6)

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These definitions have much in common: market research is essentially about the disciplined collation and evaluation of specific data in order to help student designers to understand their customers' needs better. This data may include economic, psychological, sociological, functional and cultural information. This information will enable designers to develop raw products, and also improve existing ones or try to create value-satisfying goods and services that consumers will want to buy. Decision making at this stage involves some element of risk and market research data should be used to reduce, and to some degree control, the parameters of risk surrounding particular marketing proposals.

Steps in the market research process

Obviously, the systematic collation of data cannot be achieved by cutting and pasting pictures of old catalogues of which most students do. Student designers should be encouraged to conduct in-house market intelligence as a starting point and that is, using their fellow classmates as end-users of products or 'focus groups'. After gaining some confidence in research, students can now start conducting external research in the community and below is a proposed structure, which can help them in this endeavour. This structure should not be viewed as a rigid process but rather, a starting point for continuous improvement and refinement.

1. Define the market problem to be solved, together with a specification of the research objectives. Usually, this can be formalised as a mission statement or design brief.
2. Select data collection method(s) to be used. Basically, data can be obtained from secondary and primary sources. Secondary data helps define the background but it does not help solve the specific problem at hand. Library research can help by providing some form of published information e.g. published reports. On the other hand, primary data is collected to solve a specific problem at hand. Data collection techniques cover: survey research, interviews, observational research and experimentation. Our scope would now be narrowed to customer survey research. There are two types:
 - (a) Qualitative research is exploratory and largely judgemental. One seeks to find out customers' judgements and opinions on their needs and how current products satisfy these needs. It identifies the main features of customer needs and expectations. It gives coverage to a wide breadth of issues and can study in-depth

customers' perceptions of products in a market. Qualitative research is, however, limited to small sample sizes and consequently provides only a 'snapshot' of likely market response. Qualitative research can be conducted on either a one-to-one basis or in small groups (focused groups) comprising of about 5-10 people.

- (b) Quantitative research is more specific, precise and a more quantified estimate of how customers are likely to respond to a proposed new product. This method asks a small number of specific questions to a large number of people. It seeks quantitative estimates of market response; what proposition of the market perceive a particular market need? What percentage would pay extra for added features and how much extra? Either face-to-face interviews, e-mail, telephone etc. can be used to elicit information from customers and this sticks rigidly to a carefully devised questionnaire.

Both methods often use questions, which are phrased in leading ways, and offer a range of alternative answers. This helps to structure the data analysis and interpret the results. Closed questions are also used to get the opinion of customers. Another alternative is to use the Attitude scaling method e.g. the Likert scale. This asks customers to express their attitude on a scale provided to them either verbally or on paper.

3. Select sampling method to be used – identify targets market sector (age, sex, income, occupation etc.) and sample size.
4. Develop an analysis plan – this involves specifying the data that will be reported together with selection of statistical procedures that will be employed in analysing the results.
5. Data collection.
6. Data analysis – how the collected data will be processed. This can involve simple tabulation, calculation of summarising and cross tabulation.
7. Research reporting – how results are to be interpreted and translated into decisions.

Why market research?

Holloway and Plant said, 'unless we know what our customers want, we cannot be certain that the products we produce will appeal to them.' (1989: 53) If the products are not selling, a designer needs to know whether this could be a result of economic slow down affecting all products or if customers are switching their attention to other competitors' products. In each case, a designer should have a different marketing plan to respond to the challenge. It

is important that the student designer fully understands the customers' behaviour, that is, who buys what, when, where and why? Wright (1989: 19) classified the customer behaviour as follows, 'what the customer wants now, how these requirements are likely to change in future; and what can be done to influence current future customer perceptions.'

Market research helps to determine how designers' products compare with those of their competitors. That is, it assesses the competitor's product vis-à-vis the customers i.e. perceptions about it and against their own product. The student designer would have the opportunity to find out the competitor prices and this will help him determine how much he could sell his product for. Furthermore, research is designed to help the student designer to understand the nature of the marketplace in which he operates, including understanding his suppliers, retailers, competitors and customers. This provides the student designer with factual data about what is happening in the marketplace and its size.

It can actually reduce costs by first determining the number of people who want to purchase a product at a certain price level, student designers can plan their efforts to accommodate that demand. In doing so, they eliminate as much waste as possible thus becoming cost effective and making larger profits (or compete more effectively against competitors). It is better for a student designer to do this than to produce what he hopes will be the demand and then find that there are massive surpluses of unsold items. If student designers manufacture products which mismatch the market, then, the resources will have been wasted.

Market research also establishes what customers need or want in the new product and the student designer will be in a good position to draw down the product specifications, thus establishing unique features for the customer. Using this information, the student designer could come up with a unique superior product: a differentiated product that delivers benefits and superior value to the customer. Product superiority – delivering unique benefits and product value to users – separates winners from losers. That product advantage, superiority, or differentiation is the key determinant of success. Obviously the product would meet customer needs better than the competitor's products.

Cooper said,

'A strong market orientation – a market driven and customer-focused new product processes – is critical to success. A thorough understanding of customers'

needs and wants, the competition situation, and the nature of the market is an essential component of new product success.' (1993: 77)

In support of the above-echoed sentiments, Friedman quoted Moller saying,

'In design, as in any problem-solving process, it pays to analyse the problem before creating the solution. It is better to use 10% of the resources to find out how to use the remaining 90% properly than to use 100% of the resources the wrong way.' (1997: 9)

Another point worth noting is that awareness of the competition is another good aspect of marketing. Knowing the competition can help to identify market gaps and enter the market at the right time with superior or unique products. Axion Group (2000) confirm that market research 'defines key strategic focus to capitalise on competitive weakness, emerging market trends, and unmet customer needs.'

To conclude the section, the Determine Technology Needs group (2000) identified the following as some of the areas, which would lead to a customer satisfaction if market research has been undertaken;

'Lower prices, better quality, faster delivery, new features, easier to use, more aesthetically pleasing, better service, easier to purchase, better upgrades, more customer training, more economical to operate, more environmentally friendly and great energy efficiency.'

Variables affecting human needs and wants

We live in a society orientated to increasing material consumption. We tend to discover new wants or needs as soon as the existing ones are satisfied. Need is defined as 'that is essential to life' whereas want is defined 'indicates something we would like but which is often outside our current purchasing power.' (Leader and Kyritsis, 1990: 23) However, there is a complex set of motives influencing most of the products we buy. Obviously, there are variables which affect human needs and wants. It is often impossible to develop a product, which will be equally appealing or satisfying to all consumers within a large market. In support of the latter statement, Whiteley cautions that, 'a product broadly aimed at an undefined mass is likely to fail because it does not satisfy any particular group or segment of the market.' (1993: 19) This is due to the fact that consumers may buy different goods according to their sex, age, group, income, occupation or even geographic location. It should, therefore, be evident that student designers should attempt to develop

products to satisfy specific groups of customers or a specific but large enough group of people showing similar characteristics and expectations may therefore be selected as the 'target market.' A series of criteria are needed which would enable the student designer to divide the market into small groups. This process brings forward the concept of market segmentation. Wright defined market segmentation as 'splitting of the total market into identifiable groups that behave differently in regard to the product.' (1998: 54) In advocating for the latter statement, Cooper (1993: 236) described market segmentation as 'the delineation of groups or clusters of groups or clusters of people within a market such that there is relative homogeneity within each group and heterogeneity between groups'.

However, knowledge of market segmentation can be invaluable to student designers on identifying ways of improving existing products or in enabling them to design completely new or modified products. Market segmentation can be classified as follows:

1. Demographic segmentation

This method of segmentation uses people's characteristics or sociological variables such as sex (male/female), age, income, occupation, race, social class, religion, size of the family and the stage of family life cycle i.e. young single, adult single, married with no children, married with children.

2. State of mind

This variable is also called psycho-graphic or personality segmentation. According to Cooper, it 'describes potential customers' attitudes, values and lifestyles.' (1993: 37) It focuses much on psychological measurements. Leader and Kyritsis observed that,

'Using such personality variables as autonomy, compulsiveness, gregariousness, conservation and ambition segments the market. This form of segmentation arose as a result of discovering that buyers' needs may often be differentiated along life-style or personality lines. Thus, there are buyers who are fast livers seeking up to date and/or latest trend purchases; and buyers who seek ordinary, unfrilled goods that do their job.' (1990: 53)

Each type is a different segment, to which a different product can be targeted.

3. Buyer behaviour

Also referred to as product usage. This variable involves some of the following:

- loyalty – some customers are loyal to one's designs, some are loyal to a competitors' and some move back and forth – they need

three different strategies to capture their interest to the product

- usage – the amount that different people buy and use the product.

Wright summarised these variables as follows:

- purchase occasion – regular, special
- benefits sought – quality, service, economy
- user status – non-user, ex-user, potential user, first time user, regular user
- usage rate – quantified or light, medium, heavy
- awareness – unaware, aware, informed, interested, desirous, intending to buy
- attitude to product – enthusiastic, positive, indifferent, negative, hostile. (1998: 55)

4. Geographic

This is the method that uses geographic locations such as countries, regions, counties, cities, suburbs, rural areas, population density etc. as a means of division. Climate may also be used where there are distinct differences in climate within a market. Climate also affects what customers purchase.

5. Benefit segmentation

Perhaps the most useful method of segmentation for use with a new product is benefit segmentation. It recognises that people have different reasons and motivations for buying a product, and therefore they seek different packages of benefits. For example, when purchasing a new car, some people are looking for basic transportation – a reliable, practical, low cost, safe car. Others seek a prestigious high performance car loaded with creative comforts. Using this approach, the target market defines the benefits that must be built into the new product. Usually, these benefits can be translated into specific product features, which aid the product design process.

When formulating questionnaires or conducting interviews, the student designer should know what kind of information they want from the customer/user. The following section attempts to shape the content of questionnaires to be designed.

Criteria for market selection

What are the criteria for selecting the target market and product concept from among the list of options discussed above? The following are some of the criteria a student designer can use when developing a product.

1. *Segment attractiveness* – A student designer should consider which segment is the most attractive in terms of its market size, growth and future potential.

2. *Competitive situation* – In which segment is the competition the least, the weakest or the most vulnerable?
3. *Fit* – Where is the best fit between the needs, wants and preferences of each segment and the benefits, features, and technological possibilities to the designer's product?
4. *Ease of access* – Which of the segments is the easiest for the student designer to reach in his selling effort, distribution channels etc.
5. *Relative advantage* – In which segment does the student designer have the greatest advantage over competitors in terms of product features and benefits, as well as other facets of his entry strategy? A student designer should note that 'fit' and 'ease access' are not enough, they suggest mere adequacy. They must also look for areas in which there is a strong likelihood of outdoing competitors.
6. *Profitability* – It all boils down to profits! In which segment is the student designer most likely to meet sales and profits objectively?

Information from the above section can be analysed and subsequently a concrete design brief can be drawn up. Data can also be summarised and presented in graphs, charts etc.

Why do products fail in the market place?

The following are some of the reasons why products fail in the market:

1. Lack of market research, most student designers often move directly from an idea into full-fledged development effort. In this case Whiteley quoted Lippincott explaining that,

'... no product, however well its aesthetic functions are fulfilled, may be termed a good example of industrial design unless it meets the acid test of high sales through public acceptance. Good industrial design means mass acceptance. No matter how beautiful a product may be, if it does not meet this test, the designer has failed of his purpose.' (1993: 17)
2. Inadequate market analysis.
3. Failure to spend time and money on the up-front steps (market research).
4. This situation in point number 3 is made worse by generally poor knowledge of designers concerning the broad circumstances of life and work outside the narrow frame of design. This is rooted in the lack of education for the theoretical complexity of the design task. The result is that many design projects fail to achieve appropriate goals.
5. Poor marketing research – a lack of thoroughness in identifying real needs in the market place or spotting early signs of competitors girding up to take the offensive, are often the findings of a new product post-mortem. (Cooper, 1993: 20)
6. Technical problems – the most common cause of new product failure is technical problems in the design and production. Failure to conduct thorough technical research sometimes stems from failure to understand the customer requirements. Some designers term this a 'technical dog', that is, the product simply doesn't work or falls short of performance requirements. The product is a replete with deficiencies: errors of omission (poor quality of execution) etc.
7. The better 'mousetrap' that nobody wanted. This is a technology driven product and the product is conceived and developed internally with little attention paid to the real needs and wants of the market place. It is carried away in the belief that they have a better mousetrap and that the world will beat a path to their door, without checking their assumption about the market and the customer's needs. Good examples of such products include the introduction of the IBM's first home computer the PC Junior in the 1980s. It was wrong for the market, and this misfire cost IBM \$100 million. Another example is the Sinclair C5 electric car; its failure originated from complete lack of investigation and understanding of the user need situation.
8. The 'me too' product meets a competitive brick wall. The project is usually initiated when a successful competitive product is observed. The cry goes out 'we have to have one too.' The strategy is to develop a product remarkably similar (copycat product) to the competitor's in the mistaken belief that simply being in the market will bring a 'fair share' of sales. Once a product hits the market, sales fall below expectations. Designers suddenly discover that their own offering is identical in features and prices to that of an entrenched competitor and thus the product hits the competitor brick wall. The customer has no reason to switch. Student designers need to learn that gaining a fair share of the market must be earned and the product must be there and be better (product differentiation).

9. Price crunch – The new product's price is too high. Then very few customers would manage to buy such a product.

All in all, if these deficiencies are corrected, it does not stand to reason that success will be the result. For example, if Wolverhampton Football Club fixes everything it does wrong, it doesn't necessarily mean they will win the game! That is, market research cannot guarantee success, but it does help reduce the risk and offer better prospects of success.

Conclusion

As already highlighted in this paper, it is important for student designers to carry out market research to find out the needs and wants of the customers before engaging in any meaningful product development. If this stage is omitted, it could lead to a product performing chaotically in the market place. This does not guarantee success but it eliminates and controls the risk that the student designer could run into. Manufacturing products, which mismatch the market, is a waste of resources which could have been used in a more productive manner. It is important for student designers to target a certain market when designing their products because individuals have different interests and motives for buying products. For example, there might be differences in buying behaviour of men as compared to women in relation to a certain product. To find out such buyer behaviour, it is necessary for student designers to undertake a systematic market research of which a proposed structure has been discussed in this article.

In contrast, a former leading figure in design Akio Morita (Sony Chairman) believed market research is the enemy of successful design. Morita produced the Sony Walkman cassette player and it became a phenomenal success despite objections from the marketing department that the product would fail. It is not true that market research is an enemy of success; Morita relied very much on vague needs. These are unexpressed, undefined needs. These are needs we know there are there, but cannot define or pin down because the need is so variable. The products, which are invented to fulfil vague needs such as the Walkman cassette player, rely very much on inspiration and intuition. Furthermore, Sony invented the videocassette recorder using the same strategy and it too was a success. At the other end of the scale, the Sinclair C5 electric car originated from a lack of investigation and understanding of the user need situation, and consequently it failed.

Many designers now think market research should never be allowed to become a decision substitute. The best it can do is to provide

decision support. In the final analysis, the key factor must be the adventurous student designer's judgement.

In conclusion, market research is not only a part of the design process, it also helps develop broad life skills, and benefits students in whatever area they would subsequently operate. Not all students are gifted in both practical and intellectual skills, if a student conducts his/her market research well and produces a poor product, that student should be rewarded well for the research part. As part of the general life skill, that student might end up being a successful market researcher. The current assessment methods inadequately address this area. This obviously, calls for new assessment methods.

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