PRIMARY MARKET RESEARCH TRAINING MODULE

Jennifer L Flagg

Stephen M Bauer

Vathsala I Stone

Abstract: Primary market research is a key component of new product development strategy. It can be used to identify unmet needs within a marketplace, to determine what functions and features should be embodied in a product, or to understand consumer perceptions of products already in the marketplace. This training module introduces the reader to two tools for collecting primary market research data: focus groups and surveys. Techniques for designing and conducting focus groups and surveys are discussed and examples are provided. Sampling and recruitment methods and issues are described, and the relevance of primary market research to commercialization and product planning is explored. Finally, considerations when hiring a market research company are discussed.

TABLE OF CONTENTS

1. INTRODUCTION

1.a. Primary and Secondary Market Research

Primary market research refers to the first collection and analysis of a dataset, and involves gathering data directly from product customers. Data is often acquired using techniques such as focus groups and surveys, which may be used to aid organizations in understanding the needs and expectations of their target markets. Specifically, it is used to guide activities such as product refinement, formulating new product concepts, marketing, service delivery, product differentiation and product planning. The role of primary market research is both formative and summative (Patton, 1990; Worthen et al, 1997) in making the product. It enlightens design decisions when the product is taking shape (formative role) and aids dissemination and marketing decisions at the end of the process (summative). These concepts are discussed in more detail in the Evaluation Resource Guide (Stone, et al, 2009).

In contrast, secondary market research involves the analysis of information derived from research conducted by other people and is often used in the development of business plans, marketing strategies, and grant proposals. It is used to establish and understand market demographics, market segmentation, manufacturer and product profiles, competitive landscape, distribution outlets, reimbursement levels, standards, regulations and so forth. Secondary market data sources include government reports, trade journals, consumer publications, reports from market research companies (e.g. Frost and Sullivan, Freedonia Group), databases (e.g. U.S. census), product literature, and manufacturer web sites.

The discussion that follows will introduce the reader to:

- Sampling from theoretical and practical perspectives. The important concept of purposive sampling is introduced.
- Focus groups including the moderator's role, methodology, logistics, scripting and analysis of data to obtain product requirements.
- Surveys including theoretical considerations, construction, limitations and their application to obtaining importance ratings.
- Outsourcing primary market research activities and items to consider when employing an organization to conduct focus groups.

1.b. Primary Market Research for Product Development

Product benchmarking, planning and differentiation cannot be completed without establishing customer requirements and importance ratings for these requirements. Focus groups are a common and effective tool used to discover product requirements while surveys are often used to establish the relative importance of these requirements to the customer. Focus groups can also be used to validate and complement design choices derived from ergonomic and universal design considerations by giving participants the

opportunity to interact with prototypes in a hands-on environment. Furthermore, focus groups can be used to determine the current status of competing product use or unmet need; to conceptualize an ideal product and identify its features and functions; or to obtain reactions to prototypes or competing products.

Surveys are often useful tools when asking sensitive questions, which may not be answered honestly in a group discussion. For example, surveys are often used when asking questions about price point and purchase intent. For customer centered product refinement or new product design, surveys are usually given to product customers - people using, purchasing, recommending, prescribing, maintaining and servicing the product. Marketers, engineers, and designers are usually part of the design team; however, they generally do not participate in focus groups or complete surveys.

Another form of primary market research is field testing, such as in home trials. These can be used to determine how well a product meets user needs in a home environment under real life conditions, and to identify product strengths and weaknesses based on performance rather than opinion alone. The detection of problems or bugs is particularly important for assistive technology products that are relied upon by consumers. Even slight malfunctions can have a profound impact on daily life activities, and every effort should be made to ensure that products are functioning reliably as intended.

Depending on the new product development process employed by an organization, primary market research methods may be used in varied sequences to obtain different information. Table 1 below compares the flow of primary market research activities for supply push and demand pull processes.

Table 1- Primary Market Research Activities

Supply Push	Demand Pull
Bench test- technical feasibility	Alpha focus group- identify unmet needs and ideal solution
Alpha focus group- commercial viability	Bench test- technical feasibility
Beta focus group- validate prototype	Beta focus group- commercial viability and validate prototype
Field testing- real world check	Field testing- real world check

A supply-push methodology (Leahy, 2003) is utilized when an invention has already been developed by an inventor, but does not yet have a defined position in the marketplace. In this instance, bench testing is conducted to determine the technical feasibility of the invention. Provided that the invention shows merit throughout this testing phase, an alpha focus group is conducted to determine if the invention is commercially viable. Once consumers have established that the invention is indeed needed and wanted in the marketplace, development will continue. Following completion of a prototype model, beta focus groups will reconvene product consumers to determine if the embodiment of their desired product functions and features has been sufficiently

captured. Following a series of successful beta focus groups, field testing will commence to determine how well the product meets consumer needs in real life situations.

On the other hand, if an organization is employing a demand pull methodology (Bauer, 2003), they will identify important unmet consumer needs prior to a search for technology or prior to the commencement of a development process. In this instance, alpha focus groups are often used to identify unmet consumer needs within a particular technology area. Consumers may then be guided to conceptually design the ideal product that would meet their needs. Techniques used for this process are described in more detail in the focus group section of this module. Once an ideal product has been conceptualized, a model will be developed and bench tested internally for technical feasibility. The prototype is then evaluated by consumers in a beta focus group. This group will be used to determine how well the prototype is received, and to ascertain the prototype's level of commercial viability. Upon receiving positive remarks from the focus group, the product will move onto field testing.

The following segments of this training module discuss the methods used to conduct focus groups and surveys. Although in home trials are not discussed in this document, prior publications provide many details (Stone, 2007).

1.b.i. Primary Market Research's Link to Efficacy

A companion resource guide has been developed alongside this training module, which contains rich information regarding the T2RERC's implementation of primary market research techniques. The guide specifically pertains to evaluation in the form of focus groups, surveys, and in-home product trials. The resource guide is of interest to any individual seeking to expand their knowledge beyond the material presented in this module into the realm of application of the techniques. Among other information, a series of case studies are presented along with copies of actual survey instruments and focus group scripts (Stone, et al, 2009).

2. SAMPLING AND RECRUITMENT

2.a. What is sampling?

Primary market research depends upon asking the right people, the right questions. For practical reasons (cost, time, access to participants, etc) when studying the tendencies, preferences or beliefs of a large group of people, it is generally necessary to obtain information from a part of that large group instead of questioning every individual in the whole group. The part studied in these cases is referred to as a sample or subset of the whole group, the whole group being referred to as the target population or universe. In the case of primary market research for product development, the target population consists of product customers – end-users, clinicians, caregivers and/or other stakeholders. The target population is further defined by the characteristics relevant to the purpose of research. For example, there may be interest in specific human factors (e.g. visual impairment, lack of grip strength), demographics (e.g., female individuals, elderly over 65 years of age), and/or other criteria (e.g., working women, elderly living

alone). Such criteria should define the universe first, from which we then draw our sample.

Sampling is the procedure by which to choose people for a sample so that it represents the target population with respect to those characteristics. The objective in sampling is to assure a fair representation of the relevant target population. It calls for (a) defining what the relevant characteristics are; and (b) drawing a sample so it will include numbers of people with these relevant characteristics in the same proportions as in the target population. Ideally, each individual in the target population has an equal chance to be included in the sample and there is no selector bias – this is known as random or probability sampling. This is especially a concern in experiment-based research when there is a need to make accurate statistical generalizations. In contrast, purposive sampling seeks to represent the relevant segments in the target population as closely as possible by intentionally seeking individuals that fit those characteristics. Purposive sampling is a form of non-probability sampling that allows selector bias in order to maximize the inclusion of all relevant groups from which information is needed.

2.a.i. Probability and Non-Probability (Purposive) Sampling

There are many important considerations when sampling for primary market research. For example, a researcher should consider how closely the sample represents the profile of the target population. This determines how confidently one can draw general conclusions about the population based only on the information obtained from a small group. As previously mentioned, the most reliable way (i.e., the method with least error) of generalizing would be assured through random or probability sampling. Research designs modeled after experiments (Campbell & Stanley, 1969) especially value probability sampling, although in practice alternative sampling methods may be necessary due to reality constraints. Several modified versions of probability sampling may be employed, three of which are mentioned below. In addition, other types of probability and non-probability sampling are discussed by Patton, 1990; Portney & Watkins, 1993; and Worthen et al, 1997.

Probability Sampling Examples

- *Systematic* samples are constructed by randomly drawing every n^{th} element from a pre-organized target population. Ex. from a telephone directory or a dictionary of words.
- *Stratified* sampling randomly draws elements from sub-groups or strata. Ex. randomly choose 5 students from every classroom of a school.
- *Cluster/ multistage* sampling randomly draws pre-defined "clusters" of elements, instead of individual elements. Ex. Draw "n" schools from city schools, then "m" classes in each school.

There are specific challenges posed for primary market research in fulfilling data needs through *probability* sampling. For example, diverse human factor requirements need to be considered, especially if assistive technology products are being designed, due to diverse disabilities and subsets of functional needs. It is difficult to include every type of person in a small sample through complete random sampling, which calls for a large

sample and can be cost prohibitive. Further, when working with the assistive technology products, the qualified target population has a small size to begin with. Concerns such as the unwillingness of some groups to participate in research and ethical issues involved further limit the feasibility of large samples. For these reasons, non-probability, rather than random or probability sampling procedures are more appropriate for certain circumstances. The following bullets describe various types of non-probability or purposive sampling procedures that may be employed.

Non-probability Sampling Examples

- In *purposive or judgment sampling*, the researcher hand-picks people on the basis of specific criteria (i.e. special human factors, relevant demographics, etc). Sampling is based on particular purposes or judgments, and is often used successfully in qualitative evaluations. This method does limit the power of generalizing beyond the sample group, but can be helpful for validly describing the sample.
- A researcher can also work with strata or sub-divisions within the target population and pick subjects for each stratum, and thus use *quota* sampling. This method is analogous to stratified random sampling when performing probability sampling. A pre-defined sampling frame or a map, list or directory will help ensure that people in appropriate proportions are included under each stratum. The map should show a breakdown of the sampling units (individuals, groups, and institutions), as well as the number of participants desired within each map cell. Researchers should be aware that if they allow for too many sub-divisions, they may have difficulty achieving an appropriate minimum size for each group. A good rule of thumb is to define the map with as few cells possible such that no cell remains unfilled.
- *Snowball* sampling refers to recruiting people through a process of "chain referral" in order to complete the pre-set sampling frame or mapping. One can also bring together elements of quota and snowball sampling into a basic purposive (non-probability) sampling rationale.
- *Convenience* sampling involves choosing participants who are readily available. This method is considered to be the poorest in rationale, credibility, and information yield. However, it might be useful for research depending on what challenges are faced. Convenience sampling may be appropriate based not only on cost and practical constraints but also special data needs, such as the need for in-depth qualitative information versus broad, general knowledge about a variable.

2.b. How is Recruitment Related to Sampling?

Sampling defines what and how many specific types of people are desired, and recruitment implements the selection plan by contacting individuals, getting their commitment and including them in the schedule. The following guidelines offer some practical advice for individuals involved in sampling and recruitment activities.

- Develop a sampling plan (frame, mapping) including criteria regarding target population characteristics, number, etc. Without a sampling plan, a researcher is using

"convenience sampling" where participants are chosen on the basis of availability, with vague reference to some general criteria. Without a sampling plan in place, generalization of results to a larger population may not be possible.

- "Over-sampling", that is, allowing a bigger proportion of underrepresented segments of a population is sometimes a good idea, especially when such a segment is "information–rich'. For example, when input from experienced wheelchair users is required to represent different kinds of functional needs in a focus group, the choice to include more of this group makes good sense.
- "Over-recruiting" is another helpful measure. A quality recruiter will generally attempt to obtain a commitment from more people than the sampling plan requires. This practice provides some latitude for participants who may not show up for a focus group, or who may not return a survey. It is particularly important to over-recruit because deadlines for deliverables cannot always accommodate the need for repeated focus group sessions or re-surveys, whereas some individuals can always be thanked, compensated for their time, and asked to leave if too many people arrive for a focus group session.
- Leave enough time for recruitment. Particularly when working with a highly specific sampling plan, it is important to provide adequate time to locate participants. Rescheduling a group due to a lack of participants may frustrate those who have already agreed to participate.
- Ethics and confidentiality issues should be carefully considered when designing any primary market research study. If the research is federally funded the methods will most likely have to be approved by an Institutional Review Board (IRB). Regardless of IRB involvement, care should be taken to maintain all personally identifiable information in locked file cabinets or secure electronic files. IRB's are also discussed in the Outsourcing Primary Market Research portion of this module.
- Finally, anticipate and be prepared for logistical problems in conducting focus groups (weather, transportation, etc) and telephone surveys (scheduling).

2.c. Example: Sampling and Recruitment for the Telephone-Off-the-Hook Device

The following example illustrates how protocols can be set up for sampling, using the case of the telephone Off-the-Hook device focus groups. The purpose of the focus group interviews was to obtain information useful for concept generation. This included the features and characteristics of a device that meets the needs of people that leave telephones off the hook for various reasons including stress, functional limitations, cognitive impairment, forgetfulness by elderly and child family members, and so on.

Process:

1. Define the universe of interest. The main guide is the purpose of focus groups, more specifically the evaluative question. In this example, the purpose is concept generation, and the driving question is "What features and characteristics should make up this Off-the-Hook device?" To answer this question, input for universal design or the features that interest various groups need to be targeted. The universe must include people with assumed expertise. For example, specific groups such as

families with children or elderly people leaving a phone off the hook. Other criteria are various functional needs and relevant demographics. In this instance, purposive sampling is a more logical choice than random probability sampling.

2. Once the specific groups of interest are identified, develop a sampling plan or chart to define what proportions to include. The concern is to represent/include enough people in the subsets of interest, which amounts to “quota” sampling. Ideally, "all" subgroups of interest should be heard, which is impractical as it is difficult to capture all categories in a small sample, especially in a way that reflects the US population proportions. Alternatively, therefore, we can define several independent subsets of the universe and then draw a sampling chart for each subset. In this case, we defined three groups as our three subsets, including the elderly, adults with younger children, and persons with disabilities.

3. In drawing a sampling plan/matrix to define the quotas for each group, choose the minimum number of variables and sub-divisions in order to characterize the chosen subsets, so that each category has representation in the sample. In this example, age, sex, ethnicity and income level were all originally considered important, but later we dropped income level and we prioritized age, sex and ethnicity in that order. We also decided, that ethnicity would have only two broad categories, white and non-white, thus reducing the number of cells to be filled in the sample matrix.

4. Rearrange your sample according to the practical needs of running the focus groups. In our example, 4 group sessions - three homogeneous and one mixed - seemed ideal. Homogeneous groups, consisting of individuals from only one of the sample’s three subsets, will permit natural uninhibited interactions. On the other hand, mixed or heterogeneous groups, consisting of a mix of members from each subset, permit cross-interactions among expert groups. Four groups each consisting of not more than 12 individuals would be ideal. If the group is larger it may be difficult for the moderator to ensure that all group members are participating and to maintain control of the discussion.

5. Plan your recruitment strategy. Keep a check as you call, screen and get commitment from participants. For each group, over-recruit a few participants in lieu of possible no shows. Make sure however, that even if all recruited participants show up, you may not end up with an unwieldy number, more than what the moderator can handle per session.

3. FOCUS GROUPS

3.a. Focus Group Basics

This section of the training module introduces the reader to focus group composition, logistics, recruitment and consent, as well as considerations such as moderators, and script and questionnaire development. It then provides an overview of the composition of alpha and beta focus groups, and explores a sample of methods available for analyzing focus group data.

3.a.i. Focus Group Composition

Focus groups are tools used to obtain information from carefully selected groups of people for the purpose of answering questions. Focus groups are used for many reasons including but not limited to needs assessment, product or service planning for both product refinement and new concept generation, and market, social and political studies. In the context of product planning, focus group participants usually include product consumers. However, particularly in the case of assistive technology, a range of other stakeholders may provide valuable input. This can include persons who use, buy, recommend, purchase, maintain or service a product. For example, doctors, occupational, physical or speech therapists, caregivers, and durable medical equipment suppliers may have a great deal of influence over the products used by consumers. Obtaining input not only from those who will ultimately use a product, but also those who have a stake in prescribing and/or purchasing decisions is critical when developing new products.

As described in the Off the Hook example, the desired focus group participants may be divided into subsets that distinguish them from one another. The subsets used for the Off the Hook device consisted only of end users- elderly, households with children, and people with disabilities. However, this is not always the case. There is often a need to bring in participants from other stakeholder groups. For example, one universe may consist of doctors and clinicians, while another consists of consumers with a specific level of functional impairment, and yet another universe is comprised of hospital purchasing administrators and durable medical equipment suppliers.

When establishing the composition of each target population subset for a focus group project, an important consideration is whether or not to mix participants from one subset with participants from other subsets. There are situations where sensitive information must be revealed by participants, and they may be more or less willing to share such information depending on the other members of the group. For example, consumers may be less likely to share personal information if they perceive other members of the group, such as doctors or therapists, to be intimidating.

Marketing often refers to the use of “heterogeneous” or “homogeneous” focus groups. A group is homogeneous if the independent variables are uniformly distributed throughout (all group members are from the same target population subset). A group is heterogeneous if the independent variables are non-uniformly distributed throughout (members from a variety of target population subsets). In practice, groups always fall on a continuum between homogeneity and heterogeneity. The more the heterogeneity, and more specific the information we want, the more difficult it will be to include people carrying the specific information we are looking for. In any case one should remember that independent of the sampling methodology heterogeneous target populations typically require a relatively larger sample size than homogeneous populations.

3.a.ii. Logistics

In choosing a location for focus group activities a number of factors should be taken into consideration. First and foremost is accessibility for the participants. If the focus group

will be composed of wheelchair users, individuals with visual impairments, or others who have physical disabilities, care must be taken to ensure that the proper ramps, Braille signage, and other accessibility features are present. Ideally, the facilities should offer an area for care aids and drivers of participants to relax and wait while the group is in session. A standard focus group room should offer a range of presentation formats, a two-way mirror for client viewing of the groups in process, video and audio recording capabilities, and adequate space for 12 to 15 individuals.

Additional considerations in focus group planning include the provision of refreshments to participants, particularly if the group is scheduled at a typical meal-time during the day. Transportation should be provided for individuals who may not have another way to get to or from the focus group facilities. Stipends for participation are generally in the $50 to $75 range, however many professionals will demand a premium for their time and require higher levels of monetary compensation.

Sampling methodology is used to set the number of participants that should be included in a study, while focus group logistics set the number of participants per group. Taken together, this information determines the number of groups that must be run. A minimum of three focus groups comprised of an average of eight to twelve participants is commonly recommended. Focus group logistics set an upper bound on group size of roughly 12 participants, plus or minus three participants to account for potential no-shows. Maximum group size should be reduced when participants cannot communicate as quickly. For example, if all participants in a focus group are using speech generating devices or interpreters it may be necessary to reduce the size of each group to ensure that each participant will have ample time to share their thoughts. These rules-of-thumb often provide useful guidelines. Ideally however, the number and size of focus groups should be driven by sampling and logistical considerations. Purposive sampling methodology (described in the sampling and recruitment section) can be employed to establish the minimal sample size and optimal sample composition.

Focus groups are generally limited to two to three hours, however there are exceptions to this rule. The maximum time for which a group can be conducted can be reduced for any number of reasons, such as if participants fatigue easily (e.g. elderly participants, persons with neuromuscular diseases), to avoid incurring additional facility rental and staffing costs, and as a result of location restrictions on time available. Focus group length can also be increased, however, keeping participants engaged and excited about the topic area can be particularly challenging for longer sessions. Sufficient bathroom, refreshment, and stretching breaks can help prevent the group from becoming restless.

3.a.iii. Recruitment and Consent

In order to recruit participants many market research firms maintain databases used to compile the demographic information of participants from previous focus groups. To supplement the database, recruiters may solicit interest from any number of related organizations. For example, in testing a product geared towards elderly wheelchair users, the recruiter may contact local nursing homes, assisted living facilities, and wheelchair

associations. Often a call for participants will be placed in local publications such as newspapers and magazines. Alternatively, radio and television ads have a wide reach and are also helpful methods of advertising a call for participants.

Once a pool of potential participants has been identified, or once potential participants begin to respond to a call, they must be screened to determine their fit with the sampling matrix. Questionnaires are often used as a script to ensure that all necessary questions are posed by the individual interviewing each potential participant. Screening questions often include basic demographic information such as sex, age, race, income level, level of education, size of household, and so on. Questions that are more specific to the product being evaluated are also typically posed. These may include questions about a person's level of experience with certain types of products or a product in particular. They also may include personal questions regarding a person's disability and level of functional impairment and abilities. The interviewer should attempt to collect all necessary information to make accurate determinations about where each potential participant falls within the sampling frame. From time to time potential participants may be unwilling to provide sensitive information. The interviewee may reassure the individual that they are able to withdraw from the study at any time, and all personal information will be maintained in the strictest confidence. Once accepted to participate in the focus group, participants should be provided with a letter confirming the date, time, and location of their session. A follow up call a day or two before the focus group can also help to ensure full attendance by all who were recruited.

Prior to the commencement of a focus group, the participants must provide their consent to participate in the group. If audio and video recording will occur, there should also be a video release form, enabling the use of recorded images and sounds for educational purposes. Depending on the nature of the group, participants may be required to complete a confidentiality agreement, and may also have to provide their social security number for tax reporting purposes.

3.a.iv. The Moderator and Script Development

The moderator's role is critical to ensuring that the focus group process is both efficient and effective. The moderator has a considerable workload prior to a focus group including becoming thoroughly familiar with the topic area and issues under consideration, preparing a script, and preparing questionnaires. A moderator cannot run an effective focus group without being somewhat knowledgeable on the topic of discussion. There is a common misconception that moderator experience can compensate for a lack of subject knowledge. This misconception derives from the many instances where focus groups involve well-known issues and everyday concepts. In instances where the moderator shares the same understanding of the topic area as the focus group participants it is very easy for the moderator to understand comments, integrate perspectives and guide the discussion. This belief is fully debunked when focus groups are applied to highly technical problems (e.g. telecommunications products) involving highly trained and knowledgeable participants (e.g. manufacturers, scientists, doctors, engineers, etc). Comprehensive topic area research conducted prior to script development will enable a moderator to overcome this limitation.

Important considerations for the moderator include:

- Don't alienate participants – the moderator's attitude (e.g. arrogance, rudeness, racism, sexism, cultural insensitivity, etc) can offend, anger or alienate participants. In order to provide a safe, supportive discussion environment the moderator should be friendly, tactful and respectful.
- Empathy and patience – the moderator must be aware of both verbal and non-verbal cues and (whenever possible) be patient enough to let participants clarify the issues in their own words and at their own pace.
- Don't lead or bias the discussion – the moderator's appropriate role is to structure and facilitate the discussion. The moderator should introduce discussion topics and ask for clarification but should not provide this clarification. The moderator should avoid giving signs of approval or sharing personal opinions, or identifying brand names, affiliations or sponsorships.
- Don't distract participants – the moderator's behavior (e.g. making jokes, interrupting discussion, etc) should not draw the participant's focus and interest away from the purpose of the discussion.
- Don't focus in on one (or a few) individual(s) – the moderator should draw out the knowledge and perspectives of all participants. This is an important consideration for mixed groups where the participant's education, experience, assertiveness and communication skills can vary greatly.
- Don't lose control of the group – the discussion can be taken over by one or a few knowledgeable, experienced or assertive participants. This problem can typically be overcome if moderators are both experienced and well prepared.
- Flexibility – Even the most carefully prepared questions and script may not anticipate all the topics that will be discussed during a focus group. The moderator should be comfortable going off script to expand and clarify novel, unanticipated issues.

3.a.iv.1 Focus Group Script Questions

A moderator must cover a lot of ground during a focus group. The script is used to structure and pace the discussion so that important topics are not overlooked or omitted, and helps to ensure that the nuts-and-bolts activities are completed. When developing their script, focus group moderators should employ prepared questions that anticipate issues that participants are likely to discuss, that participants may think are obvious or that are beyond the knowledge or experience of the participants. It is often a laborious process to generate a thorough set of focus group questions. However, careful question preparation drastically improves the quality and completeness of focus group data.

When focus groups are repeatedly employed for related applications efficiency and thoroughness can be improved by employing a generic question set. Generic questions are modified and expanded upon for each particular application. In addition, there are often instances where, despite their best efforts to master a topic area, a moderator may lack detailed technical knowledge. In these situations, application specific questions are typically developed with input from a research or design team.

The RERC on Technology Transfer has developed and employed a generic question set that has proved broadly useful for marketing and product planning purposes. This generic question set has been constructed around a taxonomy derived from the work of Batavia and Hammer (1990) and Lane et al (1996), and is summarized below.

1. **Effectiveness** (who are the customers, what are the needs, how are the needs met, what needs are not met)
2. **User characteristics** (functional abilities, functional limitations)
3. **Environment of use** (what environmental factors impact device performance or device safety)
4. **Portability** (locations of use, how moved between locations, who moves between locations, how often moved, disassembly needed to move)
5. **Durability** (wear, fatigue, corrosion, damage)
6. **Security** (restricting access, ensuring safety, preventing theft)
7. **Assembly** (ease of, complexity of, tools needed for, … assembly)
8. **Ease of maintenance** (repair, replacement, consumables)
9. **Acceptance** (aesthetics, social acceptance)
10. **Ease of operation** (ability to see, feel, hear, grasp, access, lift, ... the device; intuitive use, comfort)
11. **Physical safety** (critical failures leading to injury or death, pinch points, instability issues)
12. **Ease of learning** (learning complexity, instruction materials, training issues, required skills and abilities)
13. **Market factors** (purchasers, competing products, price points, distribution, reimbursement)

The vast majority of a focus group session is spent on group discussion. However, there is often a need to obtain information on topics that may be sensitive and require additional confidentiality. Further, as is the case in determining price point and purchase intent, it may be necessary to prevent group members from swaying each others' opinions. In these instances, questionnaires are an invaluable tool. In addition to enabling participants to privately respond to questions, they also provide a way to derive quantitative data from focus groups. Questionnaires are discussed in more detail n the Surveys segment of this module.

3.b. Types of Focus Groups

In terms of product development, focus groups can be utilized to establish prototype specifications for new product concepts, to validate current product designs and ascertain what refinements consumers will value. Typically, the first set of focus groups in a series are referred to as the alpha groups, and the second set of focus groups are referred to as the beta groups. While the alpha groups are centered on concept definition, the beta groups generally involve an evaluation of a prototype product. The components of a focus group may vary somewhat depending on which goals the group is intended to reach. The following examples offer two scenarios of focus group methodologies.

3.b.i. Concept Definition– Alpha Focus Groups

A focus group being used to determine specifications for a new product concept or to refine an existing product begins with an examination of the consumer's current status and background in relation to the product or concept being evaluated. This portion of the group will likely ask consumers what products and practices they currently use, and how well these products and practices are working for them. The current status discussion provides a warm-up to get the group talking and thinking critically while determining what they like and don't like about products on the market. The group is then led to discuss the specifications of an ideal product. An advantage of this methodology is that consumers are evaluating from two perspectives- what they have at home and what they would like to see. Questions pertaining to the categories outlined in the Focus Group Questions section of this document are used to develop the ideal product concept. If the group is solely charged with developing a new product concept, the group will end here with a questionnaire used to determine the price point for the ideal product.

Data sets from multiple groups are combined, and statements, ideas, and suggestions that appeared in multiple groups are given a priority ranking. In addition to between-group comparisons, the detailed specifications that result from the ideal product portion of the group can later be compared to the responses regarding current products and practices to ensure that the prototype that is based upon the ideal product specifications overcomes any limitations of the participants' current products and practices. The final report summarizing results from this type of focus group offers detailed technical specifications from which engineers can create renderings and prototypes. Additionally, price point and purchase intent responses provide the manufacturer with an idea of what cost the market will bear.

3.b.ii. Prototype Evaluation- Beta Focus Groups

In those instances where a prototype is available, in physical form or via renderings, the structure of the groups will change. If the product had not previously been evaluated by a focus group, this group would begin with the same structure as the concept definition-alpha focus groups. Following the development of the ideal product and completion of its related questionnaires, participants are presented with a prototype demonstration. They are then asked questions to determine how closely the prototype meets their vision of the ideal product. It is important to wait until after the development of an ideal product concept to show the prototype to prevent bias from being included in the group's ideal concept.

On the other hand, if the product in question had been previously evaluated by an alpha focus group, then a sample of those participants will be invited to evaluate the prototype in the beta focus groups. The beta groups begin with a ranking of the functions and features that were identified as part of the ideal product in the alpha groups. Once the relative importance of each function and feature is established, the group will be shown the prototype device. The group will then be led to discuss how well the prototype meets, exceeds, or does not meet their expectations in comparison to the previously defined ideal product. If multiple prototypes are available for demonstration, each will be discussed and ranked according to consumer preference. If consumers have the opportunity to

utilize the prototype device, their reactions may be observed and comments gathered during and after the trial period. Price point and purchase intent surveys are administered at the completion of the group, and the information from the beta focus groups is analyzed to determine the final product specifications.

3.c. Analyzing Focus Group Outcomes

Focus groups can generate thousands of divergent customer statements – mostly reinforcing one another but sometimes conflicting. For the most part, the raw data resulting from a focus group is qualitative. There are many approaches used to analyze this qualitative data including physical examination and organization of data or use of a qualitative data analysis package such as NVIVO. All of these approaches derive meaning from the data inductively. The analyst seeks to identify convergent patterns, themes, and categories of response. For a more complete discussion of qualitative data analysis, see Patton (1990), Lincoln and Guba (1985) and Miles and Huberman (1994).

With respect to product planning, focus group data is analyzed in order to come up with a set of product requirements identified by the customer. The content of the customer statements is important, but subject to misinterpretation. For example, the number of statements suggesting a particular requirement may increase our confidence in the result relative to specific population groups. However, one must be very careful in drawing conclusions. Consider for instance a focus group in which one participant makes a statement and all of the other participants nod their heads in vigorous agreement. A single statement appears in the text transcript. Without examining the video transcript, the analyst might conclude that this point lacks general support among participants. For this reason it is important that the note taker attempts to capture non-verbal participant reactions. In cases where this may not be possible, the analyst may wish to review focus group videos to ensure accurate reporting.

The most reliable procedure for analyzing focus group data is to look for patterns or trends among the data to create logical groupings. These can then be organized under categories that make sense in light of the research. In the context of product planning, we expect customer statements from focus groups to cluster into categories that in some way reflect customer needs and preferences (customer demands) for the new or improved product. One way statements are likely to be clustered is within the categories used for script development and moderation - such as durability, comfort, effectiveness, etc. However, at this stage it is often more useful to cluster the customer statements in terms of product specific categories that a designer would relate to – e.g., user interface, remote, etc. We would expect most statements of customer demands to easily cluster into such categories. The remaining statements might cluster around such issues as point of purchase, reimbursement, warranties, guarantees, and so forth.

Analysts should note that depending on the composition and goals of the focus groups, it may be helpful to compare responses from the various subsets of participants. For example, when designing a shower chair to be used in institutions, it may be useful to identify differences of opinion between those who would actually be using the shower

chair who may be focused on comfort issues, verses institutional administrators who may be more interested in cost savings and reducing injury.

A typical alpha focus group report will contain a description of the current situation, as articulated by focus group participants, and a prioritized listings of features and functions of an ideal device. A beta focus group report is likely to contain an account of participant reactions to prototypes, and a description of how well the prototype device met participant expectations of the ideal device. Both types of reports should include responses to purchase intent and price point questionnaires, and a listing of participant demographics.

4. SURVEYS

Surveys are commonly used tools in new product development. They can be employed during a focus group, or can be conducted in other settings with interviews occurring in person, over the phone, through the mail, or on a computer. Surveys are appropriately used in new product development to establish the absolute and relative importance of product requirements; purchase intent; price points; design alternatives (e.g. aesthetics, look and feel issues, etc) and general marketing information (e.g. advertising, reimbursement, distribution).

Surveys utilize questions with scaled responses; selection from among a set of choices; and rank ordering, amongst other alternatives. Open questions (e.g. fill in the blank, comments) are less common. Surveys narrow choices, sharpen definitions, and establish priorities. It should be noted that focus groups and surveys are not interchangeable tools, but should rather be used to complement one another.

4.a. Methods of Survey Administration

The four primary methods of survey administration are over the telephone, through the mail, in person (face to face) or via a website on a computer. Each method has its own set of strengths and weaknesses, a sample of which are articulated in the following text.

Telephone Surveys

Strengths	Weaknesses
• Ability to access sample population over a wide geographic territory • Ability to access low density or erratically distributed sample populations • Quick turnaround • Able to clarify questions for participants • Able to ask follow up questions to expand upon participant responses	• Survey quality depends upon the interviewer performance • May require multiple attempts to make contact • May bias representation only to those accessible by telephone • Cost – need multiple interviewers, training, and a system for individual response records

Mail Surveys

Strengths	Weaknesses
• Ability to access sample population over a wide geographic territory • Ability to access low density or erratically distributed sample populations • Sample bias is minimal as accessible population is not limited to users of telephone, Internet, etc. • No interviewer bias	• Slow turnaround • Unable to clarify questions • Unable to verify the real respondent • Low response rate • May require phone follow up • Survey must not be too complex

Face to Face Surveys

Strengths	Weaknesses
• Interviewer can offer clarification • Can conduct complex interviews with ease • Likely to capture high quality responses, particularly when interviewer asks probing questions • Lower refusal rate than other methods	• Interviewer bias may be introduced • Costly method: paying interviewers, transportation expenses, etc • Can be time consuming

Computer/Web Surveys

Strengths	Weaknesses
• Convenient way to reach many respondents quickly • No interviewer bias • Fast turnaround • Can be administered in many geographic locations simultaneously • Eliminates need for additional data entry • Least expensive method of survey administration	• Subject to errors from incompatible software, outdated browsers, etc. • Limited to those individuals who use a computer/ have internet access • May have a lower level of confidentiality

4.b. Survey Questions

How a survey question is constructed drastically impacts how the survey taker interprets and responds to it. This fact is obvious, yet it is difficult to develop universal rules or formats for question construction that will decrease interpretation variability. Part of the problem of course is that the survey topics and applications are extremely diverse. An idealized goal in survey construction is the following:

The interpretation of the survey question by the survey taker should be identical to the intended meaning of the survey question by the survey constructor.

This is an easy objective to state but a very difficult objective to achieve, as misinterpretation can occur for any number of reasons. The following examples and explanations are intended to help the reader to avoid such problems.

Example: Avoid Questions That Rely Upon Hidden Assumptions

> Survey questions should be explicit – that is interpretation of survey questions should not rely upon hidden assumptions.
>
> The statement "…the United State's intervention in the War was appropriate…" appeared in a survey six months after the Gulf War. Rather than assuming that the survey taker will know that the question referred to the Gulf War, the statement "…the United State's intervention in the Gulf War was appropriate…" is explicit.
>
> Explanation – the survey taker will make "reasonable" assumptions in order to answer the survey question. It is preferable to know that all survey takers are interpreting the question in the same way rather than to assume they are making the same interpretation.

Example: Avoid Compound Questions

> Surveys should not employ compound sentences (i.e. sentences in which two or more complete thoughts are joined together by a conjunction such as 'and,' 'or,' 'but,' etc).
>
> A statement incorporating the phrase "... should not be damaged by stovetop heat or hot water..." should be broken into two statements "...should not be damaged by stovetop heat..." and "...should not be damaged hot water..."
>
> Explanation – what part of a compound statement is the survey taker responding to? Perhaps the survey taker strongly agrees with one part of a compound statement and strongly disagrees with other parts? Perhaps they feel that one part of the compound statement is important and that other parts are not important? What "formula" will they use to come up with their response? How will we interpret this response?

Example: Avoid Use of Jargon (technical, legal, business), Slang, Dialects, etc

> Survey questions should utilize "common, everyday language" written on the "communication level" of the survey respondents.
>
> A statement incorporating the phrase "...an ergonomically shaped grip…" could be phrased "…a grip that fits the shape of your hand…"

Explanation - technical terms, marketing terms, regional dialects, etc will only be understood by designers and engineers, marketing professionals and people from specific regions. Unless the survey is designed specifically for these populations more general terms should be used.

Example: Avoid Absolute Quantities

Survey questions should (if possible) not refer to absolute quantities (e.g. size, weight, distance, brightness, etc). Generally, a better approach is to employ relative quantities referenced against everyday objects.

The statement "...weighs less than a quart of milk..." will probably be interpreted more consistently than the statement "...weighs less than two pounds..."

Explanation - most people have picked up a quart of milk many times and, in a functional sense, have an idea about how much it weighs. They probably don't know that the weight of a full quart of milk is very close to two pounds (As an experiment, ask a friend!). In general, people aren't very good at estimating absolute quantities (temperature, distance, volume, etc). In fact, there is a national contest for high school students in which the students are required to estimate various quantities. The contest winner is determined by the precision of their estimations. Student participants spend many hours learning the units of measurement and honing their ability to approximate quantities in these units.

Example: Be Careful With Words Like Never And Always

Survey designers should be very careful when using words such as 'never' and 'always' in questionnaire design.

The statement "…the laptop will never be damaged by water…" may be considered impossible while the statement "… the laptop will function properly after being immersed in water…" may be considered possible. The survey constructor must be careful about what they are asking. Do they mean 'a very long immersion' or a 'brief immersion?'

4.c. Response Scales

In the case of product planning, a scale is basically a set of numerical values that the respondent assigns to product requirements to indicate its degree of importance to the respondent. Most of the following scales are commonly used to measure people's attitudes, values or some characteristic, using a number of statements that all measure the same dimension (i.e. attitude or value).

Thurstone Differential Scales are used in marketing to measure customers' attitudes. Here, items (statements) themselves would be previously scaled by judges and placed on a continuum, before presenting them in the survey. Thus each statement has its own scale value, which is unknown to the respondent. The respondent would check only those

agreed with from a set of randomly ordered statements. The scale value of that statement would be taken as the respondent's score.

Example: A list of 50 statements regarding the importance of ramps is generated by asking people to write such statements. Another group of people are asked to judge the intensity (degree) of importance each statement reflects. They sort them out accordingly into orderly piles from low importance statements to high importance statements. The statements are then grouped and assigned values that give them their position within the total pile of statements. This survey scale of statements with pre-established values is now ready for use, without disclosing their values. Persons are asked to check or pick those statements that best describe how they feel about the importance of ramps. The value of those statements becomes their score reflecting how important they consider ramps to be.

Likert Scales present a series of statements (e.g. each representing a product requirement) and ask the respondent to select an appropriately ranked response to show the degree of agreement or disagreement with that statement (or alternatively, the degree of importance). The scale may have 5 points giving five choices that read "[SD] strongly disagree, [D] disagree, [U] uncertain, [A] agree and [SA] strongly agree". The researcher may assign point values from 1 to 5 to these choices. Thus, every individual has a point value for each statement.

Likert scales are generally used to measure individuals' attitudes, values or the presence of some characteristic. When an attitude is measured, the statements are all measuring the same basic attitude, and the summed score shows the person's degree of attitude. The same individual's responses across all statements would be summed and a score is given to the individual to indicate that individual's attitude level. So Likert scales are referred to as summative scales.

Example: Suppose an item regarding the importance of ramps is to be part of a bigger survey that measures attitudes towards accessibility. In a Likert format, the item would look something like the following.

Statement	SA	MA	N	MD	SD
It is important that every public building have a ramp.	5	4	3	2	1

Where, SA=strong agreement, MA= mild agreement, N=no opinion, MD= mild disagreement and SD=strong disagreement.

A person "mildly agreeing" with this statement would get a score of 4 for this item. Similarly, this person's scores on the rest of the items in the scale would be summed together to reflect the total score or position of the person regarding how positive an attitude they have towards accessibility in general.

Care should be taken when employing Likert scales in surveys used for product planning. In this application, the Likert scale is used to establish a mean rating (e.g. importance) for

individual items (e.g. product requirements) across all persons. Summing one person's score across all survey items has little meaning. However, in practice Thurstone and Likert scales are sometimes combined. The person's score on the likert part (each item) is multiplied by its pre-established Thurstone value to get a "product score" which is then summed over all the items.

Guttman Scales, also called cumulative scales, present statements that reflect increasing intensities. They are arranged so that a person who agrees with item 2 will have necessarily agreed with item 1; one who agrees with item 3 will have agreed with item 2; and so on. This is to ensure that there is only one dimension measured by a set of responses. As with the Likert scale, the Guttman scale is also used commonly to scale people's attitudes.

Example 1:

Statement	Yes	No
a. Wheelchair batteries should weigh less than 7 lbs		
b. Wheelchair batteries should weigh less than 6.5 lbs		
c. Wheelchair batteries should weigh less than 6lbs		
d. Wheelchair batteries should weigh less than 5.5 lbs		
e. Wheelchair batteries should weigh less than 5 lbs		

It is easy to see that anybody agreeing with "e" would necessarily have agreed also with d, c, b and a; anybody agreeing with "d" would have agreed also with c, b and a; and so on.

Example 2:
In the example below, anybody responding "yes" to "c" would necessarily have agreed to "b" and "a"; and anybody responding to "b" would necessarily have agreed to "a".

Statement	Yes	No
a. Every public building should have an entrance accessible through a ramp.		
b. All major entrances to every public building should have ramps		
c. Every entrance to every public building should be accessible through a ramp		

Unlike the Thurstone and the Likert scales, the Guttman rationale is more useful for scale development theory than for its application in practice to determine individuals' attitudes. Although not described in this training module, other techniques such as Q-sorts and the Delphi method have been successfully used in needs analysis studies.

4.d. Survey Response Formats
Reflecting the needs of product planning and marketing, a survey utilizes questions that establish the importance rating and ranking of product requirements, questions that clarify product requirements; and questions that gather marketing data. A typical new product development survey might include importance ratings, importance rankings, marketing questions and ad hoc questions.

Importance Ratings – Each product requirement is independently rated for its importance by the survey taker. A Likert rating scale is often employed. Importance ratings are explicitly used in some product planning methodologies such as Quality Function Deployment (QFD Institute, 2009).

Importance Rating Example: Rating Product Requirements

Please rate each requirement by its importance to you.
Where: 1=critically important, … 5=unimportant

	Rating
1. How important is it to be able to remotely control the device?…….1	[2] 3 4 5
2. How important is it to be able to easily use the device controls?… 1	[2] 3 4 5

Importance Ranking – The relative importance of requirements is sometimes established by direct rank ordering of requirements by their importance, or by designating a specific number of requirements as "most important." For the latter, selection frequency across surveys establishes the rank order of requirements. Importance ranking can be used to shape design priorities, such that design efforts are focused on higher ranked requirements.

Importance Ranking Example: Rank Ordering Product Requirements

Please rank order the 5 product requirements relative to each other
Where: 1=most important, …5=least important

Rank	
5…	(a) able to remotely control the device
1…	(b) easy to use (access, manipulate, …) the controls (buttons, dials, …)
2…	(c) easy to see device controls and display at night
4…	(d) able to hear device status
3…	(e) easy to understand / interpret the device display

Marketing Questions – These questions clarify price points; purchase intent; distribution and advertisement preferences; reimbursement issues; service, warranty and related issues. Marketing questions commonly employ a Likert rating scale, rank ordering or the selection of a specific number of alternatives out of all available choices.

Marketing Questions Example: Select 1 of 5 (4)

Please place a `X' next to the statement that you agree with most.

How much should the ideal device sell for?

[ ]… under $41
[ ]… $41 - $60
[x]… $61 - $80
[ ]… $81 - $100
[ ]… more than $100

At this price, how likely are you to purchase the device?

[ ]… certain to purchase
[x]… very likely to purchase
[ ] …very unlikely to purchase
[ ] …no interest in purchasing

Ad Hoc – Product requirements that are insufficiently clear can be "sharpened" by ad hoc questions. Ad hoc questions commonly employ rank ordering among design alternatives or the selection of a specific number of alternatives. Ad hoc questions help clarify product requirements (e.g. colors, button shapes).

Ad Hock Example: Select 3 out of 5 Requirements (define the ideal product)

Please place a `X' next to the three product requirements (out of five) that are most important to you.

[ ] … able to remotely control the device
[x] … easy to use (access, manipulate, …) the controls (buttons, dials, …)
[x] … easy to see the controls at night
[ ] … able to hear the device status
[x] … easy to understand / interpret display

4.d.i. Discussion of Survey Response Formats

There is some reason to argue that both importance ratings (independently rate the importance of each product requirement) and importance rankings (relative ordering of the collective product requirements) are worth eliciting from respondents. In an ideal situation, surveys are constructed around product requirements derived from analysis of the focus group transcript. The analyst is explicitly searching for product requirements that are important to the focus group participants. It should not be surprising then, that if

survey takers independently rate the importance of these product requirements that many of these requirements receive (nearly) identical high scores. In these cases, ranking establishes the relative importance of requirements.

It is important to recognize that ranking the importance of product requirements also has drawbacks. In general, utilizing the rank order or the method of selecting a specific number of alternatives will differentiate the relative importance of product requirements. However, these rankings will not establish whether the highest ranked product requirement is truly important (absolute importance is a rating). In addition, a lower ranked product requirement may still have high importance rating for the customer. In terms of product planning, it would be inappropriate to eliminate this product requirement based on its low relative ranking.

Survey designers should bear in mind that the rank ordering method is only practical for small sets of items. However, this limitation may be overcome by the use of item sub-grouping, which simply breaks a large listing of items into more easily manageable sets. This technique can be used with either the rank ordering or selecting a specific number of alternatives. Grouped items should in some sense be similar to each other and dissimilar from items in other groupings. In practical terms, product requirements can only be sub-grouped if items in each sub-group are independently known to be important and independently ranking sub-group items has no adverse implications for product design. For example, it may be possible to sub-group and rank display and control interface requirements independently from remote control requirements. In practice, establishing truly independent sub-groups is often difficult.

4.d.ii. Survey Formats for Product Planning– A Comparative View

There are many ways by which to elicit and establish the importance of product requirements to the customer. Table 2 summarizes the advantages and shortcomings of these methods.

Table 2:Comparison of Survey Response Structures			
Method	**Use**	**Strengths**	**Weaknesses**
Independently rate items, against a scale, based upon a decision criteria (e.g. importance)	• Product requirement importance ratings	• Establishes absolute item rating • Identifies all items with high ratings • Easy to use by survey taker • Easy to use over the phone	• The most important item cannot be identified from amongst equally important requirements
Rank order items, relative to each other, based upon a decision criteria (e.g. importance)	• Product requirement importance ranking • Clarify product requirements	• Establishes relative ordering among items	• Low ranking items may actually be important items • High ranking items may not be important items • Hard to use by survey taker • Hard to use over the phone • Can only be used with a small number of items
Select a specific number of alternatives	• Product requirement importance ranking • Clarify product requirements • Marketing information	• Establishes relative ordering among items • Easy to use by survey taker • Can use with larger number of items	• Low ranking items may actually be important items • High ranking items may not be important items • Hard to use over the phone
Open ended questions	• Marketing information	• Easy to use by survey taker • Easy to use over the phone	• Subject to misinterpretation by survey taker • Generates divergent data that is often difficult utilize in product planning or marketing

4.e. Pre-testing Surveys

Any information obtained through research is only as good as the quality of the evaluative procedure or instrument that is used. It is important to assure the quality of surveys and the surveying procedure by evaluating the survey itself right from the beginning stages of its development. At the minimum, the pre-testing of a survey may include the following steps.

1. Obtain input from specialists in the survey content area to critique the test items. They should determine whether questions are relevant and if they cover the essential points in the needed depth.
2. Obtain input from psychometric [test-making] specialists to critique the structure of the survey. They should review the number of items, item formats, wording and clarity, and question placement and sequence.
3. Make improvements in the survey based on the critiques and prepare a second draft.
4. Administer the second draft of the survey in a one-on-one situation to an individual who represents the respondent group. The purpose being to evaluate the survey items and make them as communicative as possible. As the individual responds to the survey, commenting freely on the clarity of items, the survey administrator also questions the respondent and registers comments.
5. After several one-on-ones, the survey should be improved into a third draft.
6. Time permitting, the draft should be administered to a small group of individuals in a "real survey" situation, without interference from the administrator. An examination of the response pattern will suggest improvements or confirm that the survey questions are yielding valid and useful information.

5. OUTSOURCING PRIMARY MARKET RESEARCH

5a. Logistics

Most organizations are not equipped to conduct their own primary research. In these instances, they may seek professional assistance from a market research firm. When identifying potential service providers, there are many factors that one should consider. For example, what type of facility will be used to conduct focus groups? If the market research organization has in house facilities, it is likely that they are adequately equipped with cameras and audio recording devices. However, if focus groups will be conducted at a remote location, such as at a hotel where a conference is taking place, then there should be some assurance that all necessary recording equipment will be available, tested, and functioning properly at the new location. If the focus group participants will include individuals who have disabilities, the facilities must be accessible. If individuals who are blind will participate there may be a need for Braille signage and tactile floor markings, whereas people who use wheelchairs may appreciate larger doorway openings and adequate sized bathrooms with appropriate fixtures and grab bars.

The focus group moderator should be experienced in conducting focus groups, and should also have a good understanding of the topic area to be discussed. The more experience a moderator has gained, the more likely they are to maintain control of the

group, ensure that all group members actively participate, and subdue any participants who attempt to dominate the discussion. Further, experience combined with a solid understanding of the topic area will help a moderator to understand when they should use probing questions to reach deeper into a participant's answer.

It is likely that the organization who will conduct the focus group will also be responsible for recruitment of participants. The client should ensure that the focus group contract details the number of participants who will be recruited, and also provides a minimum guaranteed number of participants. If too few of the recruited group arrive for a focus group, there may be little point in actually running the group. On the other hand, the organization should be careful not to over recruit so much that the group size becomes unmanageable if all participants were to show. The client should also ensure that the recruiter is using an appropriate sampling frame, as this is key to selecting the correct mix of participant demographics.

5b. Confidentiality and Institutional Review Boards

Depending on the nature of the group, the client should be assured that all participants will complete appropriate forms prior to commencement of the group discussion. At times when there is a new product concept being discussed, or a prototype is demonstrated, a confidentiality form can be used to prevent participants from discussing any focus group related information with others outside of the group. If the group is being video and audio recorded, a video release form may be used to grant permission to use focus group images and audio for educational and/or promotional reasons.

If the work is funded by state or federal money there may be a need for approval of the protocols by an Institutional Review Board (IRB). IRB approval may be handled by some market research firms; however it is often the responsibility of the client commissioning the focus group. Frequently, organizations obtaining grants from the government are affiliated with a University that already has an IRB in place. For these groups, the IRB approval process will entail sharing a detailed description of the project's methodology, data collection instruments, and data collection and protection protocols. In addition, there must also be a form to be completed by all participants that states the purpose and nature of the research being conducted, describes any risks and benefits for participants, and asks for each individual's consent to take part in the focus group activities. Once approval is granted the approved organization must ensure that all protocols are followed.

5c. Other Considerations

In summary, market research organizations should be willing to work closely with their clients throughout the entire focus group planning and execution process. In particular, the client should be heavily involved in establishing goals for the groups, developing a sampling matrix, and generating a script and questionnaires. Further, some facilities have capabilities for the client to send messages to the moderator, requesting elaboration on a response, or shifting the direction of the group. Care must be taken not to overwhelm the moderator. However, the real-time capabilities are particularly useful when unplanned ideas result from a discussion. In these instances, the client can then guide the moderator to move on with the scripted questions, or probe further into the new idea.

5d. Focus Group Reports

Once a set of focus groups is completed the market research organization will prepare a final report of the focus group findings. A typical report will begin with a description of the focus group protocols, describing the purpose of the group, the number and type of participants included in the sample, and other relevant logistic information. The current status will be described, potentially including an elaboration on competing products mentioned by participants. The description of the ideal product is often provided in a bulleted list format, with high priority functions and features at the forefront. Depending on the type of focus group conducted, there may also be a segment describing reactions to the prototype device(s), a listing of strengths and weaknesses related to each feature or function, or prioritized listings of desired functions and features. Price point and purchase intent are often sorted by type of respondent (consumer, care provider, hospital purchasing agent, etc). In addition, any focus group report should offer a detailed listing of participant demographics and copies of all instruments used, including the script and questionnaires.

REFERENCES

Batavia, A.I. & Hammer, G.S. (1990). Toward the development of consumer-based criteria for the evaluation of assistive devices. *Journal of Rehabilitation Research and Development: 27* (4), 425-436

Bauer, S.M. (2003). Demand pull technology transfer applied to the field of assistive technology. *Journal of Technology Transfer: 28* (3/4), 285-303.

Campbell, D.T. & Stanley, J.C. (1969). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally College Publishing Company

Lane, J.P., Usiak, D.J. & Moffatt, J.A. (1996). Consumer criteria for assistive devices: Operationalizing generic criteria for specific Abledata categories. *19th Annual RESNA Conference*: Salt Lake City, UT, 146-148.

Leahy, J.A. (2003). Paths to market for supply push technology transfer. *Journal of Technology Transfer: 28* (3/4), 305-317.

Lincoln, Y. & Guba, E. (1985). *Naturalistic inquiry*. New York: Sage.

Miles, M.B. & Huberman, A.M. (1994). *Qualitative data analysis.* Thousand Oaks, CA: Sage Publications.

Patton, M.Q. (1990). *Qualitative evaluation and research methods (2nd ed).* Newbury Park, CA: Sage Publications

Portney, L.G. & Watkins, M.P. (1993). *Foundations of clinical research: Applications to practice.* Stamford: Appleton and Lange (Simon and Schuster Business and Professional Group)

QFD Institute. (2009). QFD: Quality function deployment. Retrieved September 14, 2009, from http://www.qfdi.org/

Stone, V.I. (2007). Product evaluation from theory to practice: Lessons learned from efficacy studies of assistive technology products. Annual Meeting of the American Evaluation Association, Baltimore, MD.

Stone, V.I., Lockett, M. & Usiak, D.J. (2009). A resource guide to evaluation in the context of new product development.

Worthen, B.R., Sanders, J.R. & Fitzpatrick, J.L. (1997). *Program evaluation: Alternative approaches and practical guidelines.* White Plains, NY, Longman, Inc