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RESEARCH PROJECT MANAGEMENT, HANDLING SURVEYS

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ABSTRACT

Research Design is the lifeblood of the research. The questionnaire is like a red blood cell in research design. Red blood cells in the human body carry fresh oxygen throughout human body. Similarly the survey gives the respondent's responses, based on which research findings are concluded in social sciences. Despite so much importance of questionnaire, there are very few studies which cover questionnaire design and guide research student and scholars to design a questionnaire. Survey design is least discussed topic in several books written on research methodology. In this paper, after thorough review of several books and articles on the subject, the authors provide a guide for research scholar on questionnaire design. To make understanding of questionnaire design and selection easier this research paper has selected and explained three research papers which future researchers can use as a guide to create a questionnaire. The Paper also shares list of several books and an articles literature review which is useful for future researchers and practitioners to understand and study the research methodology.

INTRODUCTION

A questionnaire is a research tool, which consists of questions, designed by a researcher to collect responses from respondents. The term questionnaire was first time used by Francis Galton in late 1800. He was a British anthropologist and statistician. Later in 1838 Statistical Society of London defined the research questionnaire. Since then the questionnaire is of the famous research instrument being used by many researchers. Compared to other technique of research which is observation and experimentation, the survey is a very cheap and easy method to conduct research. It requires less time, money and effort compared to experimentation. There are different types of questionnaires

based on research objective and study world view. However, the questionnaire is mainly used to measure the concepts and constructs, which cover behavior and opinion of consumers (Gault, 1907; Jacoby, Jacob; S.Matell, 1971).

PROBLEM STATEMENT AND AIM OF THE STUDY

On research methodology, multiple books are written which mainly discuss the research paradigms or worldviews (Post-positivism, Constructivism, Transformational and Pragmatic world view), research methodology (Inductive and deductive) and research methods (Qualitative, Quantitative and Mixed Method). In this regard books of Cress Well on research design are most often referred in social sciences. Some books have also covered the data types (Nominal, ordinal, interval and Ratio) and explained the type of test which can be used in different type of data. For instance, Uma Sekaran's book on research design. Because of wider scope of these books for earlier researchers, it is very difficult to extract the main information; sometimes while understanding the concepts, the initial researchers miss the main points in the book. The research papers address the two key concerns of a research student. First, it has listed all the essential resources (Books and articles which researchers can read to gain the information on methodology aspects), Second it also shares complete guidelines on questionnaire design.

The authors have done the thorough a literature review of the articles and identified that existing articles does not provide clear guidelines for questionnaire design. Therefore, in this research, three have been selected which researchers can use to identify type study they want to conduct and type of questionnaire which they can select to collect the data. The research paper also provides the guidelines on survey design, important points which researchers should consider while designing a questionnaire. This paper also provides a checklist which researchers can use to improve the questionnaire.

BRIEF LITERATURE REVIEW

Designing a questionnaire is a very critical step in research. It is focus area of research since 1800. In 1831 when the Statistical Society of London defined questioner, the questionnaire became of the favorite tools in research design later. Gault (1907) conducted a study in the history of the questionnaire method of research in psychology, he more focused on the introduction of the survey, Initial days of investigation and its definition. The author has provided possible future implications of the study. In earlier days the psychologists were only limited to the measurement of human behavior which is possible to view with the help of a human eye. For example, the buying behavior of customers, how many products they are buying, from where they are purchasing the products. However, the constructs which were not visible with naked eye were not measurable. The psychologist used to think, that this is a limitation of psychology. However, Resins Likert who introduced Likert scale was an American psychologist, based his name Likert Scale is named. He used this scale in his doctoral thesis and told the psychologists that the construct which is not visible with the naked eye could be measured with the help of questions. Later that methodology of asking question became famous with his name as Likert Scale.

Likert scale today is one of the widely used scales. After introduction of Likert scale the author further focused improved on the scale in the regard Jacoby, Jacob; S. Mattel (1971) conducted research on Communications and Research Notes Content. The researchers have explained how the Likert scale can be used for dichotomous variables. The primary practical implication of this study is that investigators would be justified in scoring Likert-type scale items dichotomously (or dichotomously), according to the direction of response after they have been collected with an instrument that provides for the measurement of instruction and several degrees of intensity. Further research should now be conducted to determine whether the present findings can be generalized beyond the Likert-type scale to different types of scales (e.g., Osgood's semantic differential. Thurstone-type. Similarly, in the late 80s, Converse & Presser (1986) wrote a book titled "Survey questions: handcrafting the standardized questionnaire (Converse & Presser, 1986), the author has explained the strategies for experience and research. The experimental piece of evidence and tools for analysis. Dr. Floyd J. Fowler (1995) wrote a book on Improving Survey Questions_ Design and Evaluation The author have explained the questions as a measure, Question as a measure, designing items to gather factorial data, Things to measure subjective states, some ethical rules to develop a good questionnaire

Bradburn, Sudman, & Wansink (2004) wrote a book titled "Strategies for asking questions. Strategies for asking questions, tactics for asking questions, drafting and crafting the questionnaire. (Tourangeau, 2005) wrote on paper on Survey Questionnaire Design. The author highlighted the survey questionnaire design is least studied a topic in the last 30 years. As per author, the previous book on questionnaire design was written many years ago. There is a need to update the methodology Survey questionnaire design encompasses a variety of activities ranging from library research to formal experiments that estimate the reliability or validity of different versions of a questionnaire. Although handbooks with advice for survey questionnaire designers first appeared more than 60 years ago, in last 30 years, the researchers have attempted to provide a firm theoretical and empirical foundation for such guidelines, based on a cognitive analysis of the survey response process. The past 30 years or so have also seen an expansion in the methodological and statistical tools used in developing survey questionnaires; these tools include focus groups, expert reviews, cognitive interviews, field tests, behavior coding of respondent-interviewer exchanges, experiments, and several statistical methods

Miller & Miller (2007) conducted research on addiction research methods (Miller & Miller, 2007) and explained in edification area the Research Fundamentals, Sampling strategies for addiction research, Experimental design issues in addiction research, Qualitative methods and theory in addictions research, Ethical issues in alcohol, other drugs, and addiction-related research. Chea (2007) wrote one paper on Questionnaire Design and Data Analysis: An Alternative Approach in Student Evaluation of Teaching (Set) the author has explained identifies the weaknesses of the traditional approach in Student Evaluation of Teaching (SET) questionnaire development and analysis of data collected from the questionnaire. The researcher paper then provided an alternative method to measure SET items and progress of

inquiry which also involved student's collaboration, as previous researchers always ignored the most critical component of any study of the customer. The way questions asked is an essential component of the questionnaire design. The earlier researchers also studied this aspect. See et al., (2011) wrote one paper on attitude of health care staff toward serving HIV or AIDS patients and drug users and about questionnaire design and evaluations. The author was of opinion because of attitude of staff the questionnaire validity and reliability are getting affected. The researcher has explained the way staff (HCWs) interact with HIV or AIDS patients, and drug users during their duty positively influence the sustainability of the reduction of programs. To evaluate the professional attitudes of staff, the author has designed a questionnaire which can help the HIV or AIDS surveyors to know the useful responsible of the patients. It will also be beneficial for the doctors to know the accurate, in-depth response of the patients.

On questionnaire design, Roopa & Rani, (2012) wrote one paper. The paper explained. This paper is focused on questionnaire. It gives the guidelines about writing a valid survey. Surveys are usually used in quantitative research in the field of social study. An inquiry is a series of questions asked individuals to obtain statistically useful information about a given topic. When properly constructed and responsibly administered, surveys can become a critical tool with the help of which the respondent's statements can be recorded regarding a construct — the survey valuable methods of collecting a wide range of information from many individuals. For a questionnaire, to get is optimal use the authors have given the guidelines which researchers can use to design a questionnaire. Roopa & Rani also explained the type of questionnaire and the initial phrasing which can be used. The authors described the modes of data collection which researchers can use to collect the data.

The most often referred book of Creswell (2009) titled "Research design; qualitative, quantitative and mixed method research design" is also tool for researchers to understand the research methodology. Creswell (2009) has mainly focused on word of abstract, objectives, questions, hypothesis and results. However, the author has not focused on questionnaire design. Bradburn, Sudman, & Wansink (2004) wrote one book on asking questions. The book mainly focused on strategies, tactics of asking questions. The book has also explained the drafting and crafting of the questionnaire. It primarily focused on the selection of words and formatting of survey.

Hastert & Griffiths (2012) conducted wrote a book titled Handbook of Survey Methodology for the Social Sciences. In the book, the author has explained the introduction of survey. Issues which survey methodologies had and described the way how future researchers could design a questionnaire. The author has demonstrated how future researchers can resolve the response and non-response errors, survey design modes and applications and sensitive, difficult survey topics were also designed in the survey.

Sopher (2012) wrote a book "Collecting, managing, and assessing data using sample surveys and discussed the Basic issues in studies, Ethics of studies of human populations, designing a study, Methods for conducting investigations

of rational people, Focus groups, Design of survey instruments. Janzen (2015) conducted research on constructing A Theory of Planned Behavior Questionnaire. Janzen core focus was on guiding the researchers how to design a questionnaire to measure the attitude. (Krasnik, 2017) wrote a book with the title “The Palgrave Handbook of Survey Research.” Research Design Guidelines” and explained the Positivist Application, Pragmatistic Applications, and Constructivist Applications. Strang (2015) wrote a book titled The Palgrave Handbook of Research Design and described the traditional Conventional Survey Research, Opportunities to Expand Data Collection and Linking Survey Data with External Sources

Evans, Grub, & Zobel, 2014 published an excellent book on How to Write a Better Thesis. The Alia Ahmed (2015) Using Split-Questionnaire Design: An Empirical Analysis. This article focuses on making the questionnaire less lengthy from the respondents. The author believes respondents hesitate to provide the right response against lengthy questionnaires. Splitting a long survey into parts reduces the burden on the respondents as also increases the chances of getting fast and reliable responses from respondents. In the paper, the authors have attempted to compare a new survey technique, i.e., the Split-Questionnaire Design (SQD) and have compared it with the existing classical Full Questionnaire Design (FQD). Though developed recently, SQD has not yet been widely used in surveys.

Based on the literature below is the final guidelines which cover all aspects of the questionnaire.

Guidelines for Questionnaire Design

Do not Re invent the wheel

- If you are trying to measure an attitude, concept, or behavior, there’s a pretty good chance someone has done this before. Use their questionnaire
- It is recommended to study the research paper in your area
- Still if you are unable to find a Questionnaire. Below are link of survey databases
 - <http://www.gss.norc.org/> The
 - <http://www.umich.edu/%7Eenes/IPoll>
 - <http://nrs.harvard.edu/urn-hul.eresource:roberctr>

Things to consider while Creating A Questionnaire

- Introduce yourself, your research and give instruction about the scales used in the survey
- Keep your questions short, Keep the questions in order
- Avoid using technical words. Pretest survey, make sure respondents understand questions
- Avoid vague, ambiguous and misleading questions and complex senses
- It’s better to give an example if method or ratings are changing with questions.
- Never ask two things in one question.
- Make sure answers has all possible options

Table 1 Summary of Literature Review

#	Book/Article	References	Focus Areas
1	Research Design: Qualitative, Quantitative, and Mixed Methods Approaches	(Creswell, 2009)	Helping Researchers in writing research Explanation of research paper or thesis
2	Asking Questions	(Bradburn, Sudman, & Wansink, 2004)	Strategies for asking questions, Tac Drafting and Crafting the Questionnaire
3	Survey Questions: Handcrafting the Standardized Questionnaire	(Converse & Presser, 1986)	Strategies for experience and research evidence, Tools for research
4	Handbook of Survey Methodology for the Social Sciences	(Hostert & Griffiths, 2012)	Introduction to Issues of Survey M Survey, Response and Non-Response Modes, and Applications, Sensitive and
5	Improving Survey Questions_ Design and Evaluation	(Dr. Floyd J. Fowler, 1995)	The question as a measure, designing i Things to measure subjective states, so good questionnaire
6	Addiction Research Methods	(Miller & Miller, 2007)	Research Fundamentals, Sampling research, Experimental design issu Qualitative methods and theory in issues in alcohol, other drugs, and addi
7	The Palgrave Handbook of Survey Research	(Krosnick, 2017)	Research Design Guidelines, Positiv Applications Constructivist Applications
8	The Palgrave Handbook of Research Design	(D.Strang, 2015)	Conventional Survey Research, Opp Collection, Linking Survey Data with
9	Collecting, managing, and assessing data using sample surveys	(Stopher, 2012)	Basic issues in studies, Ethics of stu designing a study, Methods for co rational people, Focus groups, Design
10	How to Write a Better Thesis	(Evans, Gruba, & Zobel, 2014)	What Is a Thesis, Thesis Structure, M a Strong Start, The Introductory Cha Establishing Your Contribution, Ou Discussion or Interpretation, The Conc
11	A History of the Questionnaire Method of Research in Psychology	(Gault, 1907)	More focused on introduction of t investigation and its definition. The a future implications of the survey
12	Questionnaire Design and Data Analysis	(Chea, 2007)	This paper identifies the weaknesses o Student Evaluation of Teaching (SET and data analysis. It then describes an alternative approac which involved students- collaboration
13	Professional attitude of health care workers toward serving HIV/AIDS patients and drug users: questionnaire design and evaluation	(See et al., 2011)	The authors have designed a survey w surveyors to know the useful responsib be beneficial for the doctors to kn response of the patients
14	Questionnaire Designing for a Survey	(Roopa & Rani, 2012)	This paper is mainly focused on guidelines about writing a valid questi
15	SQB Methods Fact Sheet 1: Likert	(Johns, 2010)	This article has explained the Likert so

	Items and Scales		articles. Before the Likert scale the p limited to observable latent behavior psychologists started measuring the responses.
16	Communications and Research Notes Contents	(Jacoby, Jacob; S.Matell, 1971)	This article has explained how the L dichotomous variables
17	Constructing A Theory of Planned Behavior Questionnaire	(Ajzen, 2015)	Ajzen core focus was on guiding the questionnaire to measure the attitude.
18	Rutgers Cooperative Extension Program Evaluation Youth Audience	(Routgers, 2011)	This is a questionnaire used in the Ru program. This article has a beautiful w to get the answers from the students (C
19	Using Split-Questionnaire Design: An Empirical Analysis	(Alia Ahmed, 2015)	This article focuses on making the qu the respondents. The author is of th hesitate to provide the right questionnaires.
20	Electronic Questionnaires Design and Implementation	(Minto, Beltrame Vriz, Martinato, & Gregori, 2017)	This article focused on providing guide
21	The Science of Asking Questions	(Schaeffer & Presser, 2003)	This article discusses the difficulties scales, the number of groups, categor and acquiescence. The paper also question testing and evaluation
23	Questionnaire design improvement and missing item scores estimation for rapid and efficient decision making	(Ergu & Kou, 2012)	The paper discusses the Analytic H collect the customer's responses quickl
24	Teaching applied value of marketing research: A questionnaire design project	(Makienko & Bernard, 2012)	The paper explained how mark implemented using the research q responses.
25	Improving response rates and questionnaire design for mobile web surveys	(De Bruijne & Wijnant, 2014)	The author has highlighted the drawba collection. The author explained how increased with the help of a web surve
26	Survey Questionnaire Design	(Tourangeau, 2005)	The author highlighted the survey q studied a topic in the last 30 years. book on questionnaire design was writ

Making a questionnaire is a very critical step in social sciences, particularly in the quantitative researcher. Most of the students adopt the survey from previous studies. Many papers are also available where researchers have developed a scale for any construct measurement. However, there are fewer studies on questionnaire design and survey items selection from literature, and this study addresses that gap.

RESEARCH METHODOLOGY

In research, there are Methodologies, Quantitative, Qualitative and Mix Method. The quantitative approach follows the positivist point of view, while the qualitative follows the constructivism point of view and mix methodology follows both. Cress well divided the mixed methodology into further three types which are Convergent Mixed Method, Explanatory following mix method and exploratory Sequential mix method. The technique of mix method is comparatively new, compared to a quantitative and qualitative approach. In

all mixed mode and quantitative researchers, the research is bound to make a questionnaire. Based on the questionnaire the respondent responses are collected and measured. The questionnaires' feedback can be collected in multiple formats which are Ordinal, nominal and interval and ration scale. Based on the way further, a different test is applied to the collected data. Most of the students face challenges in applying the proper test on the data because they don't think about the questionnaire design and the importance of the items prior to selection of the questionnaire and its sale. This research paper is primarily focused to help the new researcher on making a questionnaire, selecting the variables for the questionnaire.

In this study we have analyzed, three research paper, which researchers can view to understand the type of questionnaire they want to write and how it implements to them.

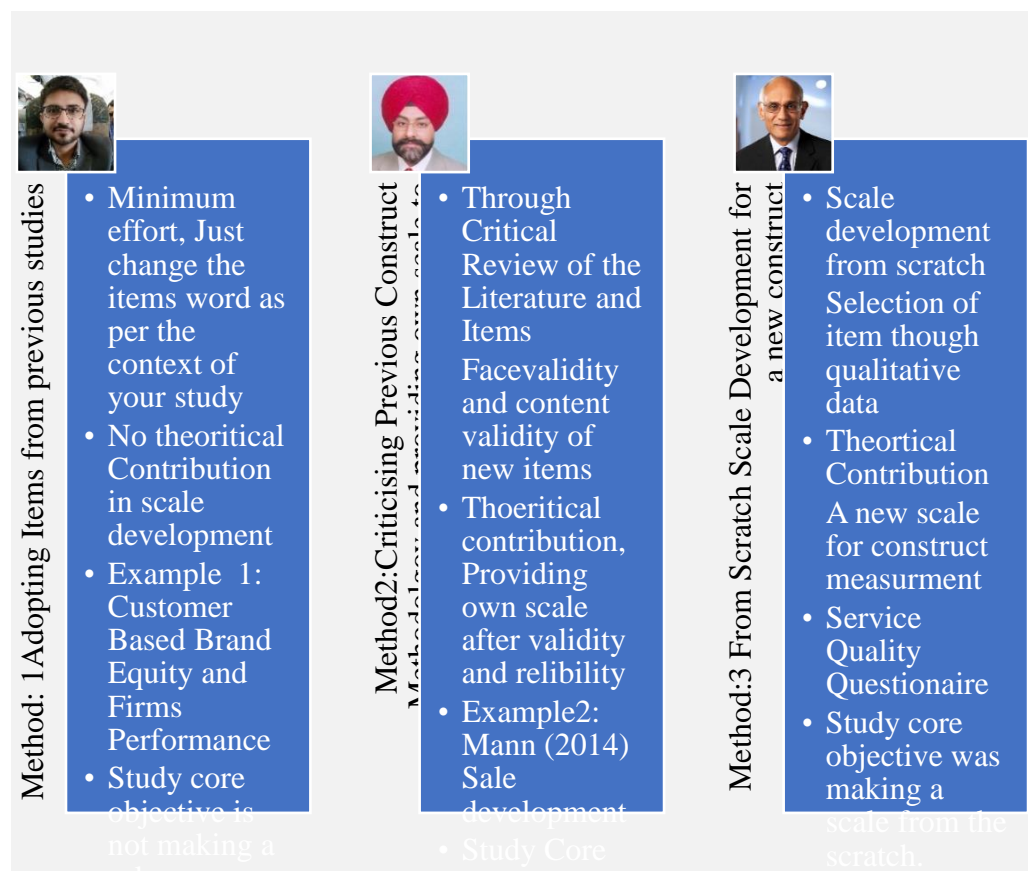


Figure 2 Three Methods to Create a Questionnaire for studies in Social Sciences

Research Paper 1: Adopting a questionnaire form previous studies.

Customer-based brand equity and firms' performance in the telecom industry

The methodology used in the paper (Buzdar, Janjua, & Khurshid, 2016) This is the easiest approach and recommend for master's students. Students can

directly use any previous research paper used questionnaire. In this research paper, the author has adopted the questionnaire from Aaker model of Customer-based brand equity. The author has used the same constructs independent variables; Brand awareness, brand image, Perceived quality and brand loyalty and measured the brand equity of telecom companies in context of Pakistan. This research questionnaire selection can be used even in the doctorate level thesis, where the researcher is providing a methodical contribution. Over here on point is important to note this study paper was not to design a scale. Therefore it used an earlier scale. The next two methods core objective is making a scale.

Research Paper 2: Designing a questionnaire based on the previously collected data

Scale development and validation for measuring corporate brand associations

In this paper (Mann & Ghuman, 2014) the researchers, core objective was making a scale on a very popular construct. The Author has studied completed Literature and discussed the scale given by previous authors. After content and face validity of the questionnaire, a questionnaire was selected. Based on that questionnaire data were collected from different fields. The author has finalized a questionnaire after making sure the validity, reliability is at the required threshold against every item. For research items where the reliability and validity were not at the required threshold were removed. For the convenience of understanding of researchers, the figure-1 shows the list of earlier constructs and criticism of the author. The figure two shows the new items for the measure of brand association provided by the author.

Note: The author has listed whole concepts and multiple variables, just for an understanding of the readers, we have given snapshot of top rows in the paper.

Table 2: Corporate brand associations considered in the pre-test

<i>Dimension</i>	<i>S. No.</i>	<i>Statement</i>	<i>Source</i>
Dynamism	1.	This company has prospects for future growth.	Heerden and Puth (1995); Sung and Yang (2008)
	2.	This company is always improving.	Heerden and Puth (1995)
	3.	This company has a clear vision about its future.	Schwaiger and Zhang (2009)
Corporate ability/ Performance	4.	This is a successful company.	Souiden et al (2006); Anisimova (2007)
	5.	This company is the industry leader.	Souiden et al (2006)
	6.	This company is financially sound.	Souiden et al (2006)
	7.	This is an economically stable company.	Schwaiger and Zhang (2009)
	8.	This company is innovative rather than imitator.	Souiden et al (2006); Schwaiger and Zhang (2009)
	9.	This company recognises and takes advantages of market opportunities.	Caruana et al (2006)
	10.	This company has strong management.	Caruana et al (2006)
	11.	This company is at the forefront of the technology.	Anisimova (2007)
	12.	This company strongly supports research into technology.	Anisimova (2007)
	13.	The company is pioneering in its industry.	Souiden et al (2006)
	14.	This company does not have much experience.	Newell and Goldsmith (2001)
	15.	This company is skilled in what it does.	Newell and Goldsmith (2001)

Figure 3 Method-2: The way Author Criticized the previous Scales

Table 3: CFA fit indices in the three sectors

	Insurance	Automobiles	FMCG
Chi-square (df = 329)	2179.09	1515.56	1454.87
Root Mean Square Error of Approximation (RMSEA)	0.13	0.11	0.11
Comparative Fit Index (CFI)	0.92	0.89	0.86
Incremental Fit Index (IFI)	0.92	0.89	0.87
Normed Fit Index (NFI)	0.90	0.87	0.85
Non-Normed Fit Index (NNFI)	0.90	0.87	0.86

Table 4: Confirmatory factor analysis for corporate brand associations' scale

Factors and key variables	CFA factor loadings		
	Insurance	Automobiles	FMCG
<i>F1: Corporate ability and growth (CA&G)</i>			
1. This company has potential for future growth.	0.87	0.84	0.81
2. This company is always improving.	0.91	0.92	0.79
3. This company has a clear vision about its future.	0.92	0.86	0.75
4. This is a successful company.	0.84	0.71	0.76
5. This company recognises and takes advantage of market opportunities.	0.79	0.73	0.51
<i>F2: Symbolic benefits (SB)</i>			
1. Products of this company express youthful spirit.	0.77	0.72	0.57
2. If I purchase a product of this company, I would feel that I made a smart choice.	0.77	0.70	0.72
3. If I purchase a product of this company, I would feel that I stand out in a crowd.	0.84	0.70	0.65
4. Products of this company help to get admiration in society.	0.92	0.82	0.78
5. If I purchase a product of this company, I would be able to express my personality.	0.94	0.82	0.87
6. This company helps to display status symbol.	0.88	0.89	0.78

Figure 4 Method 2: Designed new Scale***Research paper 3: Designing a questionnaire from scratch.******SERVQUAL: A multiple- Item Scale for measuring consumer perceptions of service quality***

In the third research paper (Parasuraman, A., Zeithaml, V., Berry, 1988), has provided a scale from scratch. For this paper, we have selected many papers carefully, but finally, we picked this paper because this paper is widely used in the social sciences. More than 20,000 researchers have used the given model of Parasuraman in their researches. The author provided the questionnaire regarding the service quality; it was basically given in context of retailing. The author has described that whenever any customers go to a service center or any retail shop he experiences falls under five main categories which are his satisfaction with the tangibles. By tangibles, the author meant the building and staff dressing. The other aspect which author has given is empathy; it says the extent at which the employees understand the customers. It is all about putting the shoes of customers from the company side. The third aspects the author give the responsiveness it means how early and in which way the employees respond to the customers. The fourth aspect is the assurance. It means the ability in which the employees let the customers realize that they will solve the problems. Below picture copied from

Parasuraman paper shows the summary of steps which were used to make a new construct.

The new researchers willing to make a new questionnaire can follow the below process. There were in total 11 steps involved in making of the questionnaire. It will not be an exaggeration if we say that this the most cited research paper in history of social sciences. The steps which Parasuraman used are below.

The step one for making a scale which Parasuraman follow was the definition of service quality. He also explained the discrepancy between the consumer's perception of services offered by a firm and their expectation about the firm. In second step he identified the 10 dimensions in context of service quality construct. In third steps, he created 97 items representation the 10 aspects. In fourth stage, the author further collected the expectations and perception of 200 respondents. In step 5 the author has purified the scale with the help of computation of coefficient alpha and total correlation for each dimension, selection of items whose item in total correlations were low and whose removal increased coefficient scale, factors analysis to verify the dimensionality of overall scale, the reassignment of items and restructuring of the dimension where necessary. In step 6 the author identified the 34 elements representing the second round 7 dimensions. In step 7 the author again collected the data again 34 items from the 200 respondents in the field of retailing. In step 8 the author performed the evaluation and further purification of 34 item scale by using the same iterative sequence in step 5 of each for data sets. In step 9 the author presented the identification of more parsimonious, 22 item scales representing the five dimensions. In step 10 the author performed the evaluation of SERVQUAL reliability and factor structure. The author again reanalyzed the 22 item scale. In step 11 the author showed the assessment of the validity of the scale.

Summary of Steps Employed in Developing the Service-Quality Scale

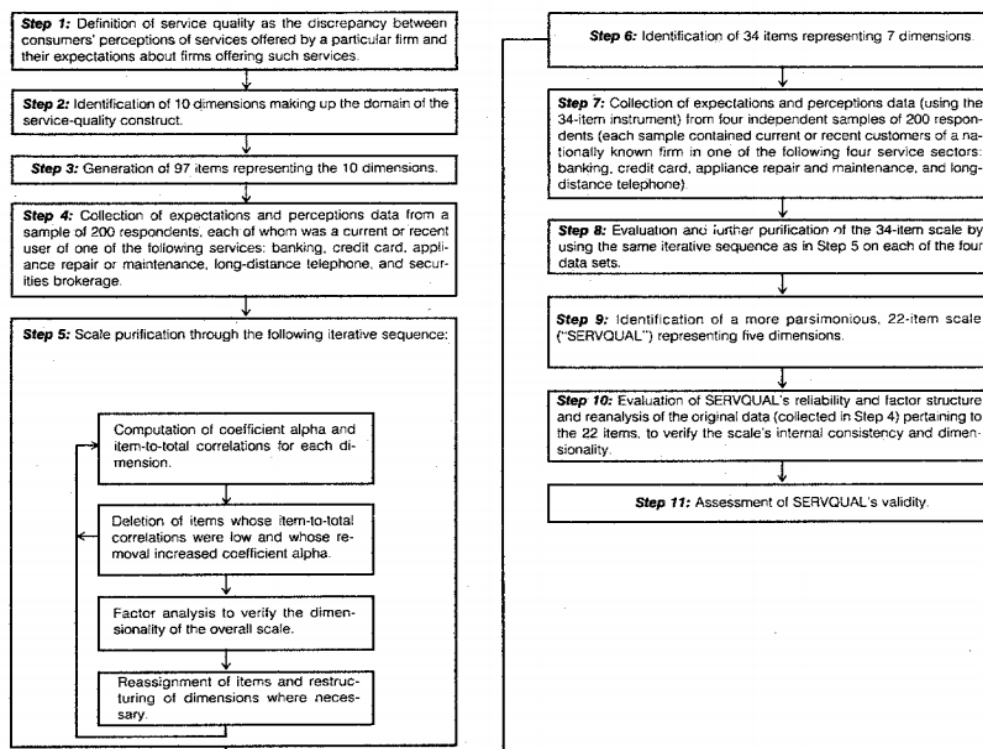


Figure 5 Method 3: Steps followed to Make a Questionnaire First time

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