Measurement and Scaling Techniques in Research Methodology; Survey / Questionnaire Development

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International Journal of Academic Research in Management (IJARM)
Vol. 6, No. 1, 2016, Page: 1-5, ISSN: 2296-1747

www.elvedit.com

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Abstract

One of the important research tool is questionnaire. In order to develop a survey/questionnaire, first the researcher should decide how the data is measured to collect. Scaling is the branch of measurement that involves the construction of an instrument. There are a number of factors that should be considered to choose an appropriate scaling method in a questionnaire and which ones to use while analyzing data. This paper is summarizing the different types of scaling methods to provide a guideline for selection of scaling method for survey/questionnaire.

Key Words

Scaling Method, Research Methodology, Survey and Questionnaire

I. Scaling Methods

Once the variables of interest have been identified and defined conceptually, a specific type of scale must be selected. Scaling methods are divided into two main categories, open questions and closed question. Scaling is the process of generating the continuum, a continuous sequence of values, upon which the measured objects are placed.

An open question is one in which the respondent does not have to indicate a specific response. Open questions have a tendency to generate lengthy answers. Often, respondents see open questions as an opportunity to respond to a question in detail. The advantage of open questions is that they allow the respondent to provide an answer that is not restricted to a select view. In addition, open questions can provide some very interesting qualitative findings that may lead to new insights, or possibly help to develop future research ideas (Wilson, 2010). There are two disadvantages associated with open questions. First, too many open questions can make the analysis and interpretation of the findings extremely time-consuming. Second, it can make a comparative analysis of qualitative answers difficult.

A closed question is one in which a respondent has to choose from a limited number of potential answers. Usually this is a straightforward yes or no. Other closed questions may require the respondent to choose from multiple response options such as multiple choice questions, Likert scale and Semantic differential scale. From another angel, scale methods could be classified as a rating scales and attitude scales. Table 1 shows some of the commonly scaling methods with a brief description.

TABLE 1: SOME COMMONLY USED SCALING METHODS, ADAPTED FROM DAVIS (2005)

Scaling Techniques
Rating Scales
Graphic Rating Scales
Itemized Rating Scales
Comparative Rating Scales
Attitude Scales
Likert Scale
Semantic Differential

1.1. Rating Scales

Raters evaluate a person, object, or other phenomenon at a point along a continuum or in a category. A numerical value is then assigned to this point or category.

1.1.1. Graphic Rating Scales

Raters mark, or indicate in another fashion, how they feel on a graphic scale of some sort. A common graphic scale is the thermometer chart.

On the scale of 0 to 100, please indicate how you would grade your knowledge about e-services.

100 very best 50 indifferent 0 very worst
Record grade ---------

1.1.2. Itemized Rating Scales

Raters select one of the limited numbers of categories that are ordered in some fashion. The number of categories is usually between 2 and 11. The itemized scale at the right is a 3-point scale.

How interested would you be to use e-service?
Very interested
Somewhat interested
Not interested

1.1.3. Comparative Rating Scales

Raters judge a person, object, or other phenomenon against some standard or some other person, object, or other phenomenon. The scale can take a variety of forms. One comparative rating scale is the rank-order scale.

Please rank the following e-service applications in terms of your usage. Assign 1 to the most usage application, 2 to the next, etc.
___ Ticketing
___ Banking
___ Shopping

1.2. Attitude Scales

Any one of the variety of scales that measure an individual's predisposition toward any person, object, or other phenomenon. These scales differ from rating scales in that they are generally more complex, multi-item scales.

1.2.1. Likert Scale

Respondent indicates degree of agreement and disagreement with a variety of statements about some attitude, object, person, or event. Usually the scales contain 5 or 7 points. The scales are summed across statements to get the attitude score.

Using e-service is a wise idea.
Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree

1.2.2. Semantic Differential

A semantic differential scale intends to see how strongly the respondent holds an attitude. These scales include a progression from one extreme to another Respondent rates an attitude object on a

number of 5 or 7 point bipolar adjectives or phrases. The selection of adjectives or phrases is based on the object, person, or event.

Please rate e-service on the following dimensions.
Secure:--:--:--:--:--:--:--:--:Not Secure
Easy to use :--:--:--:--:--:--:--:--: Difficult to use

II. CONCLUSION

This paper presents the different types of scaling methods adapted from Davis (2005). As mentioned, there are two main types of scaling namely; Rating Scales and Attitude Scales. Researcher need to select one scaling method before development of the survey/ questionnaire.

ACKNOWLEDGMENT

This research was prepared under support of Research and Development Department of Hamta Business Solution Sdn Bhd and Ahoora Ltd | Management Consultation Group.

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Authors' Biography

Hamed Taherdoost is holder of Bachelor degree in the field of Science of Power Electricity, Master of Computer Science (Information Security), Doctoral of Business Administration; Management Information Systems and second PhD in the field of Computer Science.
With over 16 years of experience in the field of IT and Management, Dr Hamed has established himself as an industry leader in the field of Management and IT. Currently he is Chief Executive Officer of Hamta Business Solutions Sdn Bhd, Director and Chief Technological Officer of an IT Company, Asanware Sdn Bhd, Chief Executive Officer of Ahoora Ltd | Management Consultation Group, and Chief Executive Officer of Simurgh Pvt, an International Trade Company.
Remarkably, a part of his experience in industry background, he also has numerous experiences in academic environment. Dr Hamed has published more than 100 scientific articles in authentic journals and conferences. Currently, he is a member of European Alliance for Innovation, Informatics Society, Society of Computer Science, American Educational Research Association, British Science Association, Sales Management Association, Institute of Electrical and Electronics Engineers (IEEE), IEEE Young Professionals, IEEE Council on Electronic Design Automation, and Association for Computing Machinery (ACM).

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