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Role Of Market Research - A Case Analysis Of Kellogs Company Sales Drop In The Year 2013-2017(Failure Analysis)

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ABSTRACT
N\A
Keywords: N\A...

1.1 DEFINITION

Process of involving a wide rage of data, in prior to address the market indicators that drives the growth of company is termed as market research.The concept in involving wide range of information to determine the company opportunities, problems, prediction of determining which method need to be adopted analytically to resolve a doubted case of company success ratio is termed as market research(Naresh & Satyabushan,2019).To explain it with practical example,launching of Loreal lipstick through mobile platform.

Objective: Loreal introduced new product through unique packaging. For their product to be in successful notation, they were curious to know how well those information and use of product has the reach to the consumers.

Method: MR people did a small survey for four days through mobile-measure.com, in mobile survey platform.

Process: through those survey people where able to share their feedback through posting a video by sharing their thoughts towards that product after their use and from those survey results researcher can understand their need and setback in the product launched.

Solution: From the data obtained from the survey the company could determine the success ratio of the product directly from consumers.

The America Marketing association, as of 2017 defines market research as , " the collection of information or data based on objective definition, the use of information is for proper prediction of decision making, to determine solution to problems is termed as market research".

1.2 TYPES OF MARKET RESEARCH- DEFINING PROBLEM FACED BY KELLOGS SALE ,AN OVERVIEW.

1.2.1 Problem identification research and problem solving research

The problem need to be identified, based on to which the solution to problem can be derived with various market research process.Thus market research has been classified based on determining the problems and how the solution can be obtained for those problems.

Real time example company name is kelloggs sale problem identification through market research.

PROBLEM: The below financial data summary depicts the KELLOGGS SALE RA

from the year 2013 to 2017. we were able to depict that the sale ratio has drastically decreased from the year 2013- $14792 to 2017- $12923. In terms of gross profit percentage it has been seen that the on year 2013 it was 41.3% where as in year 2015 it was 34.7%.

ITEM 6. SELECTED FINANCIAL DATA

Kellogg Company and Subsidiaries

Selected Financial Data

(millions, except per share data and number of employees)	2017	2016	2015	2014	2013
Operating trends					
Net sales	$ 12,923	$ 13,014	$ 13,525	$ 14,580	$ 14,792
Gross profit as a % of net sales	38.9%	36.5%	34.6%	34.7%	41.3%
Depreciation	469	510	526	494	523
Amortization	12	7	8	9	9
Advertising expense (a)	731	735	898	1,094	1,131
Research and development expense (a)	148	182	193	199	199
Operating profit	1,946	1,395	1,091	1,024	2,837
Operating profit as a % of net sales	15.1%	10.7%	8.1%	7.0%	19.2%
Interest expense	256	406	227	209	235
Net income attributable to Kellogg Company	1,269	694	614	632	1,807
Average shares outstanding:					
Basic	348	350	354	358	363
Diluted	350	354	356	360	365
Per share amounts:					
Basic	3.65	1.98	1.74	1.76	4.98
Diluted	3.62	1.96	1.72	1.75	4.94
Cash flow trends					
Net cash provided by operating activities	$ 1,646	$ 1,628	$ 1,691	$ 1,793	$ 1,807
Capital expenditures	501	507	553	582	637
Net cash provided by operating activities reduced by capital expenditures (b)	1,145	1,121	1,138	1,211	1,170
Net cash used in investing activities	(1,094)	(893)	(1,127)	(573)	(641)
Net cash used in financing activities	(604)	(642)	(706)	(1,063)	(1,141)
Interest coverage ratio (c)	9.5	4.6	6.8	7.3	14.3
Capital structure trends					
Total assets	$ 16,350	$ 15,111	$ 15,251	$ 15,139	$ 15,456
Property, net	3,716	3,569	3,621	3,769	3,856
Short-term debt and current maturities of long-term debt	779	1,069	2,470	1,435	1,028
Long-term debt	7,836	6,698	5,275	5,921	6,312
Total Kellogg Company equity	2,212	1,910	2,128	2,789	3,545

FIGURE 1: FINANCIAL DATA OF KELLOGS(2013-17)(Annual report)

To determine the solution to this problem, it is advice to follow the market research process, through which we can determine the solution to above problem.

The problem solving approach can be implied by the process of segmentation, pricing, branding, product,and promotion research, in later stage of analysis. The concept of dependency of problem

solving is entirely based on determining where exactly the problem is.

1.3 MARKET RESEARCH PROCESS

The market research process can be conceptualized basically following six major steps.

To determine the problem faced by kelloggs company during the year 2013-2016, has made people to worry where they lag in.

One of the major challenge for the company director, investor was that what made the sale ratio go down, which they were not able to predict through direct methodology, which can either way cost them in other terms can create loss. So it was advice to company , to apt for a market researcher, who can determine the proper decision to this problem by adopting the 6 basic process in market research. Defining each step with proper connotations can do help in determining the solutions to concentrate where they lag in and where they can invest bravely to increase their sales ratio. The confidence of research output can determine the indicators that are related to sales revenue increase in kelloggs company.

The research process

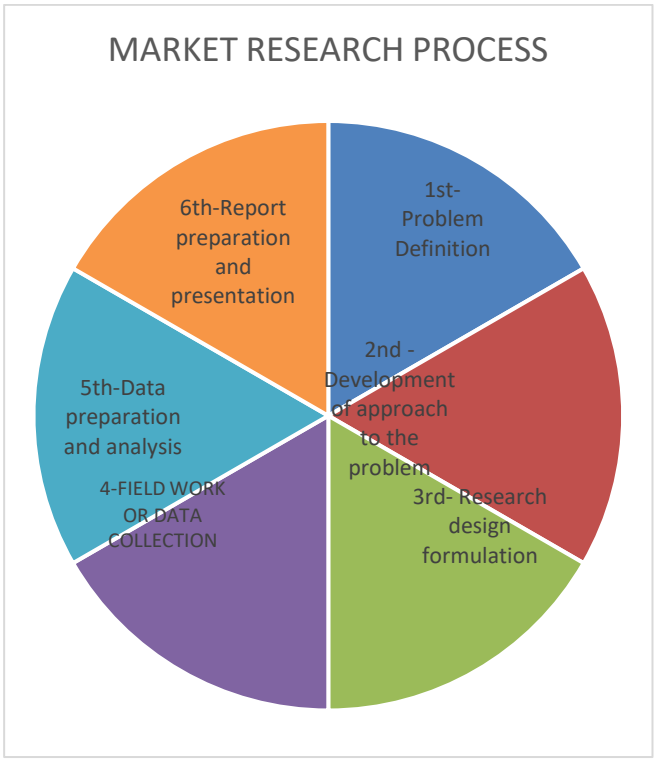


FIGURE 2: THE 6 STEP RESEARCH PROCESS

(Naresh & Satyabushan,2019).

In the next chapter let us discuss each and every research steps adopted by the kelloggs company in order to gain their sales ratio back by the year 2017.

CHAPTER 2:

RESEARCH METHODOLOGY TO FIND A SOLUTION TO KELLOGGS COMPANY

2.1 STEP1: APPROACH TO PROBLEM: The financial data summary depicts the KELLOGGS SALE RATIO from the year 2013 to 2017. we were able to depict that the sale ratio has drastically decreased from the year 2013- $14792 to 2017- $12923. In terms of gross profit percentage it has been seen that the on year 2013 it was 41.3% where as in year 2015 it was 34.7%.Main idea is to determine the

The factors related to increase and decrease in sales

The brand equity of kelloggs

The regression analysis to extract the related dependent indicators with respect to independent sales indicators of kellogs product including the external factor

To determine which particular product of kelloggs has be most welcomed by consumers, mainly through adopting a dummy variable.

No of marketing technology needed to promote the brand, such as ad, promotions, cupons, free trial

Pricing strategy

The quality of food products and the main factors which drives the sale may be in terms of taste, smell, health,quantity.

To adopt what type of advertisement.

To determine the co-linearity between sale, promotion and ad

The hypothesis of relating the positive context of kelloggs comapny products.

To have a small idea to determine the store provisions to kel;loggs product, the instore role in sale influence through store environment.

2.2.1 THE EVIDENCE RELATED TO FALSE ADVERTISEMENT METHODOLOGY ADOPTED BY KELLOGGS COMPANY-

On June 3, 2010, Kellogg's was found to be making unsubstantiated and ***MISLEADING CLAIMS*** *in advertising their cereal products by the* ***FEDERAL TRADE COMMISSION*** *(FTC).****[59][60][61]*** *Kellogg's responded by stating "We stand behind the validity of our product claims and research, so we agreed to an order that covers those claims. We believe that the revisions to the existing consent agreement satisfied any remaining concerns."****[61]*** *The FTC had previously found fault with Kellogg's claims that* ***FROSTED MINI-WHEATS*** *cereal improved kids' attentiveness by nearly 20%.****[62]*** *The* ***CHILDREN'S ADVERTISING REVIEW UNIT*** *of the Council of* ***BETTER BUSINESS BUREAUS*** *has also suggested that the language on Kellogg* ***POP-TARTS*** *packages saying the pastries are "Made with Real Fruit" should be taken off the products.****[63]*** *In July 2012, the UK banned a "Special K" advertisement due to its citing caloric values that did not take into account the caloric*

*value of milk consumed with the cereal.**[64]** In 2016 an ad telling UK consumers that Special K is "full of goodness" and "nutritious" was banned.**[65]***

https://en.wikipedia.org/wiki/Kellogg%27s#Advertising_claims

2.2 Step 2: development of approach to problems

The main criteria of this approach is to sort down the information related to problems faced by the kelloggs company in the department of sale of products.

These data collection has a greater influence to the type of products that has been driving down the sales directly or indirectly.TO obtain a solution to this it is now in need to concentrate on people need, choice of product, their trust, loyalty indicators towards the product. Let us now have a summary of products and their brands manufactured by kelloggs company.

2.2.2 PRODUCTS OUTLOOK BY KELLOGGS COMPANY

Top 10 TYPE OF FOOD MANUFACTURED

CRACKERS

TOASTER PASTRIES

Cereal bars

Fruit-flavored snacks

FROZEN WAFFLES

VEGETARIAN FOODS

BRANDS NAME

EGGO

GARDENBURGER

PRINGLES

SUNSHINE BISCUITS

CEREAL TYPES

Honey Nut Cheerios

Frosted Flakes

Raisin Bran

Cap'n Crunch

Cinnamon Toast Crunch

Frosted Mini-Wheats

Lucky Charms

Rice Krispies

Apple Jacks

Froot Loops

2.2.3 FACTORS RELATED TO DECLINE IN SALE

With the support of data as collected, we could justify that the kelloggs company, lackes in sale due to adopting

Wrong branding strategy

Limited target to audience

Failed in adopting proper market promotion methodology

They lack in determining what drives the sale increase, due to no proper decision making

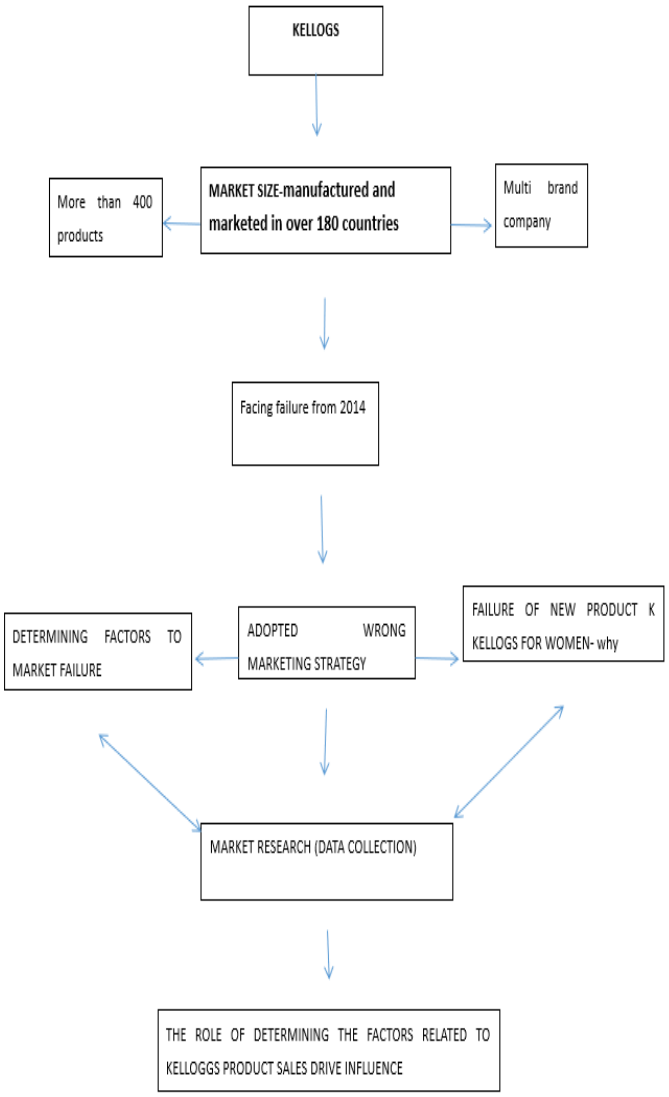
Questionable quality of food

The factors related to fall in sale are not administered properly.

Finally the store environment and packaging through which they lack.

To determine solution to all this above related issues, it is now in need of market researcher, who can address each oif above problems faced by kelloggs Company. Considering me as the researcher, some of the data need to be collected in prior to carry out the solution in order to address the problem faced by the company.

2.3 STEP3: THE RESEARCH DESIGNING FORMULATION



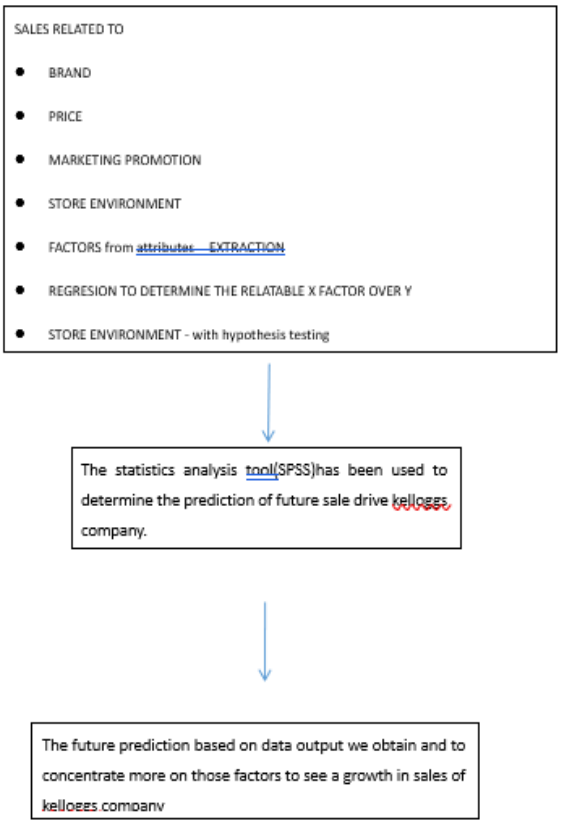


FIGURE 3: FLOW CHART TO DESCRIBE THE PROCESS OF APPROACH TO PROBLEM IN MARKET RESEARCH BY KELLOGGS

2.4 STEP 4 : THE ROLE OF MARKET RESEARCH-DATA COLLECTION

Defining data-process of collection , analyzing, interpreting information is defined as data.

2.4.1 Types of data

Qualitative- notes on sampling

Quantitative- notes on questionnaire

Surveys are quantitative

Survey research

2.4.2 SCALE - THE STUDY OF SCALE DEPICTS THE BASELINE OF DATA CLASSIFICATION AND INTEPRETATION TOWARDS THEIR COMMON CHARECTERSTICS, IN OTHER TERMS THE DATA WITH:

NOMINAL-gender, name , age, place

Ordinal-ranking- definite order

Ratio-presence of real zero- no value,income, ratio data

Interval- 2 defining properties, zero has value for ex: Temparature, arbitary is zero where distances are equal after zero.

Conversion of data has been carried out from higher form to lower forms of data, that is from interval to ordinal

to collect data in form of interval or ratio form

2.4.2.A INTERVAL SCALE AND RATIO SCALE

Statistics is the methodology, tool and skills acquired by a managerial mind for making a decision in a critical way with the data acquired after analysing, summarising and obtaining meaningful inferences based on the economical, demographical, political, environmental aspects and demand for the company, which would finally satisfy the consumer needs,(Daczel and Sounderpandian, 2009).It is termed as group of data acquired to take a decision.It cannot be defined and it is not constant, but it can be acknowledged in terms of logical decision making from the data acquired, with the change of time and circumstances.

Dr. Arif explained that statistics is not only termed as analytical understanding of a problem , but it also includes the prediction, forecasting and understanding models to obtain better decisions and statistical knowledge to enhance better thinking and decision making.(Arif, 2016).

Before heading to the study of interval and ratio scale of data analytics in business statistics, it is important to acknowledge the basic terminologies in statistics in the form of data interpretations. In general the statistics is the applied mathematics , a basic concept to express measurement of things through data analysis in the form of measurements.(Sarle, 1995).

Measurement is the term that denotes the physical relation of the object that is represented in the form of numbers. To determine the measurement of objects it is important to be familiar with the terms and operations related to things, through which the data can be interpreted in the terms of scale, otherwise stated as scale of measurement of data related to the things.

S.S. Stevens, in the journal paper “On the theory of scale of measurement”’ stated that measurement is the term used to define a thing or attribute related to any function, which the result is expressed in terms of number and measurement. To explain about levels of measurement it is important to be familiar with relations and operations of numbers related to things and through which the result can be expressed in terms of SCALE.(Sarle,1995).

The measurement theory is the basic fundamental concept followed in measurement, it was broadly classifed in to two namely,

classical measurement theory

Modern measurement theory

Classical measurement theory was introduced by cambell in his research, measurement is restricted to the assignment of numerical to represent the properties of the objects in the basis of the physical law .

Fundamental measurement of a property is based on the physical operation , which is performed on the object possessing that property.

This classical measurement is applicable only to limited extent, where then property posses length, weight, density, mass, volume, numerosity etc.

According to cambell, he stated the it is not in our hands to measure certain property, it is not easy to determine the exact measurement of property how much ever computations has been made to the property as the property posses pre existing property.

The alternative approach , which was introduced by stevens, in other terms called as Modern Measurements.

This measurement theory has a broad approach , which is not only related to its physical properties but related to the empirical properties mapping or relations in to formal model.

This theory concentrates on psychophysical and psychological properties of the objects, such as anxiety, achievement, utility. It is exactly contrast to the classical measurement, that created a all new evolutionary new concept of measurement in measurement theories.

This measurement concentrates on mapping the empirical properties of the properties. operations that establish a valid basis for the assignment of num eras to empirical values of properties and events

2.4.2. B SCALE OF MEASUREMENT

In general, the measurement of statistics is carried out in scale. Stevens broadly classified the levels of scales in to,

Interval Scale

Nominal scale

Ratio scale

Absolute scale

Ordinal scale

He explained the above scales in terms of basic empirical operators, mathematical

group structure and permissible statistics.

SCALE OF MEASUREMENT	BASIC EMPERICAL OPERATORS	MATHEMATICAL GROUP STRUCTURE	PERMISSIBLE STATISTICS	DEFININ G IN TGERMS OF ATTRIBUTES	EMPERICAL EQUATIONS	EXAMPLE
INTERVAL SCALE	Determination of equality of differences	Linear group Y=BX+A	Transformation from centigrade to Fahrenheit F=1.8C+32	Assigned numbers such that difference between numbers reflects different in attributes	m(x)-m(y)>m(u)-m(v a(x)-a(y)>a(u)-a(v)	The development of commendatory
RATIO SCALE	Determination of equality of Ratios	Similar group	Coefficient of variation, length in cm.	Ratio between numbers reflect ratio of the attribute	t(m)=c*m Where c are constants.	The thermodynamics, where the expansion ratio goes to. Zero
ORDINAL SCALE	Determination of equality of order of numerical	multiplication by a constant	Grades of academic performances	Order of number reflects an order of relation to an attribute	a(x)>a(y)=m(x).m(y)	Warmer, colder and series of natural events

NOMINAL SCALE	Determination of equality of order of same value.	Arranging in orders	Number of football players, number assigned to religious alphabetical orders	Two things are assigned the same symbol of they have same value of attribute.	1=Hindu 2= christian 3=Muslim 4=Jain	Freezing or not freezing.

TABULATION 1: TABLE FOR DESCRIPTION FOR TYPES OF SCALE

The above tabulation depicts the different types of scales namely, ordinal scale, nominal scale, interval scale, ratio scale. These were explained in the context of basic empirical operators, mathematical group structures, permissible statistics , defining in terms of attributes and empirical equations.

2.4.2.C INTERVAL SCALE

Before analysing in to the context of insisting the interval valued scale in present market strategies,Chirstos,Anastarios,Andrew and Antichrist briefly explained the orthodoxy of the scale and its value towards the marketing . Under the traditional way of measuring the data from respondents through the scale parameters , the concept of measuring tool is based on the context of measuring uncertainty, perceptions of people, value of questioning, level of understanding of scenarios.

The comparative study between the semantic differential scale with that of interval value scale can provide us a wide data based on the independent values of the scales. The robustness of the scale is displayed when the measure of uncertainty can play a major role in insisting the data from the respondents. The blow scale diagram represents the graphical representation of interval valued scale.

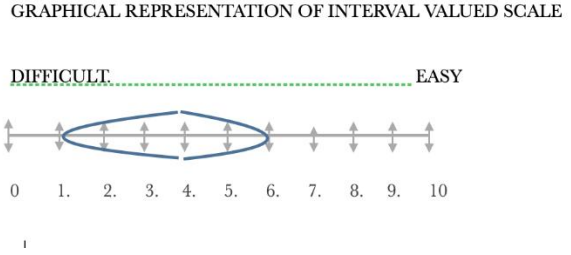


FIGURE4 :GRAPHICAL REPRESENTATION OF INTERVAL VALUED SCALE

The graphical representation of interval valued scale depicts that when the interval ellipse closer to the left, the more uncertain questions, the respondents accept the attributes.The ellipse closer to the right, the more easy the questions been g measured and the width represents uncertainty .In simpler terms Chirstos stated interval valued scale can measure uncertainty on the issues which can intern provide us the data from the respondents which can evaluate uncertainty with the context of providing relevant information to concentrate more on particular uncertainties to analysand the risk factors from the data obtained from respondents.

Interval valued scale can provide a choice to respondents, so that the researcher or a person can provide outcome with more exact information rather than questioning uncertainty. It can provide more data related to raised questions and scenarios. IVS has the new way of measuring responses and uncertainties, it is the analytical tool which is capable to derive data insight , and can give good perceptions of situations and can produce straight forward answers.

2.4.2.D RATIO SCALE

The ratio scale can be explained in two complementary aspects

measurement devises

Questions about the objects, property, and operation of measurement

In general terms ratio scale is termed as the mathematical group of structure that generates a transformation in mathematical way of property in terms of numbers generated by the scale and still leaves the scale invariant(Harker, 1987).

The general characteristics of ratio scales are

the property of the objects is considered in terms of measurement

Ratio scales are restricted to extensive properties

Ratio scales are valid only if the property measured in accounting is a physical property

Physical instruments such as measurement scale, thermometer and barometers are defined in the terms of what they used for rather than in term of structure

5) psychological magnitude ∂ is related to stimulus magnitude Ø,

Where ∂=k , where K is constant.

The Psychophysical law states that "EQUAL SUBJECTIVE RATIO CORRESPOND TO EQUAL SIMULTANEOUS RATIO"

2.4.3 USES OF RATIO SCALE

sociology

criminology

Political science

Considering ratio scale in terms of accounting.

To determine number of monetary units, accounting function in to simple process of counting cash, measure of. Monetary numerosity

For example, foot is the standard for measuring length, pound for weight.

Money for measuring monetary unit is stable in value.

2.4.4 DATA CLASSIFICATION

	NOMINAL	ORDINAL	INTERVAL	RATIO (ZERO HAS VALUE)
CLASSIFICATION	YES	YES	YES	YES
ORDER	NO	YES	YES	YES
DISTANCE	NO	NO	YES	YES
REAL ZERO	NO	NO	NO	YES

FIGURE 5: TYPES OF SCALE

2.4.4.A QUESTIONAIRE

Scale is the tool used to measure the responsive nature of participants

Two types of scale used to collect data namely like rt and semantic scale

Interlink scale- 5 point like rt scale and 7 point like rt scale

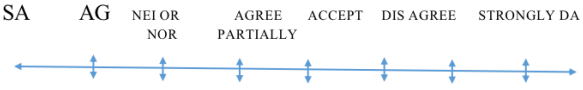


FIGURE 6: LIKERT SCALE

2.4.4.B USES LIKERT SCALE- WHY ODD NUMBERED

Interpret data for all practical purposes

Mean and average

It is subjective

Tendency to play safe

Mark neither

Error in inflation

No midpoint 1 to 4 & 5 - interval

Extent to which like or dislike

Sufficient heterogeneity

It has more scale level- yes and no questions

Easily understandable, incentive appealing

Measure in terms of aggregate

Greater the no of scale level greater to like or dislike

2.4.4.C SEMANTIC DIFFRENTIAL SCALE

BIPOLAR SCALE- TWO ADJECTIVE

INTERVAL DATA

DISADVANTAGE- LEVEL OF CONFUSION INCREASE, WHEN LEVEL INCREASE

MEASURING EMOTION

ADVANTAGE -THE INTERVAL SCALE ARE NOT EQUAL, NOT AN INTERVAL SCALE DATA TO BE CONVERTED TO LIKERT OR SEMATIC SCALE.

BASED ON QUALITY OF DATA

CHAPTER 3

QUALITATIVE RESEARCH USING SPSS SOFTWARE -DATA PREPARATION

AND ANALYSIS IN MARKET RESEARCH PROCESS

3.1 OBJECTIVE TO CARRY OF THE QUALITATIVE RESEARCH

To narrow down the data using 7 to 1 like rt scale

Considers the attribute and factors

Every attribute are considered to maximize the variance because of attributes

Fundamental flaws: In scale

Ranking data- no ranking can be performed- ordinal data not interval data

In order to opt for best feature -hundred point scale

Zero-ratio real feature

Attribute exceed 10 or 12

Counterbalancing: Presenting same attribute in different order

Disadvantage-time consuming

3.2 QUESTIONNAIRE DESIGN

Collection of data and to design it

Good question and good quality decisions

Questionnaire design

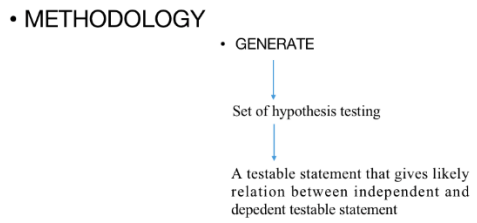
Question should be clear

Should not repeat

Purpose of the research

Based on scale

Introduction



3.3 Testable statement

Positive relation between two variables based on expectation

Ensure that no variable is left out

Ensure that every question should measure a centipede variable, independent variable or a control variable

Co variate analysis

Control variable- extemporaneous variable that could be affecting the result in my data

Length- incentive survey participation rely on relationships

Always use Multi item measure

use pre-existing scales: ensure reliability and validity

construct= variable

scale- pattern of items to measure same construct

like rt scale measurement

3.4 ERROR

Reduce error-it shows "precise tendency of preponderant" To gravitate towards middle of scale

Adding no.of questions to reduce to error

Two types of error

Instamatic variation error

Random variation error

Characteristic of error

When error occurs in +Ave or -Ave direction error is truelove random

3.5 QUALITIES OF ERROR

Error is truelove random

When error occurs in positive or negative direction

The statistical check or test for quality of data

Quality of data:

To cancel the random variation error the statistical check or test for the quality of data is carried out

Reliability: Consistency, measuring same construct the same construct

Optimum stimulation level

Validity: Correctness and three items are measuring the same construct that ought to be measured

Reverse scored questions

Liable and valid score

Compute reverse score items

Compute the cornbach alpha

Optimum stimulation level

Extent of status equation that is desired to determine the mirror image or reverse scoring

Formula is

Reverse scale formula is:

Minimum scale+maximum scale- respond ants score.

3.6 REVERSE CODE ICON- cornbach alpha

	OSL2	OSL3	OSL4
R1	1	2	2
R2	5	4	5

CORR(OSL2,OSL3)=0.7

CORR(OSL3,OSL4)=0.6

CORR(OSL2,OSL4)=0.5

CORNBACH ALPHA=(0.7+0.6+0.5)/3=0.6

3.7 RELIABILITY OF DATA USING SPSS SOFTWARE

3.7.1 Case 1

The market researcher of kelloggs has now decided to carry out the research process after the collection of considerable data through customer survey to nearly around 62 consumers. To carry out the reliability analysis of kelloggs product the researcher carried out a questionnaire with regards to how customer react after consuming the cereal products of kelloggs, the questionnaire had this following content.

To measure Optimum Stimulation Level (OSL) of the consumers of kelloggs product. They consulted the MR and saw the scales for OSL and found them to as follows:

I like to continue using kelloggs cereal for morning breakfast

I like to experience sweetness in cereals factor in kelloggs in my daily morning routine.

I like a food that offers change, variety, and quantity, even if it involves some time to prepare.

I am continually felt for new health content and quick snack experiences after consuming kelloggs cereal products.

I like continually changing type of food produced by Kellogg company.

When i love to see kellogs products can be a replacement to dinner also

I prefer a change in packaging for kelloggs .*

DATA COLLECTION AFTER SURVEY

osl1	osl2	osl3	osl4	osl5	osl6	osl7	revosl7
2	4	2	3	4	4	2	4
4	3	2	2	2	2	4	2
3	2	3	2	3	2	4	2
3	3	2	2	3	2	3	3
4	2	2	2	2	2	4	2
4	2	2	2	2	2	3	3
4	2	5	2	2	2	3	3
4	2	2	3	3	2	4	2
5	2	2	1	2	2	4	2
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4	2	4	2	3	2	4	2
2	3	1	3	3	2	2	4
4	1	2	1	2	2	5	1
4	2	2	2	2	2	3	3
4	2	4	2	2	2	4	2
4	2	4	2	2	3	2	4
2	3	4	2	3	2	2	4
4	2	2	2	2	3	4	2
3	3	2	1	3	1	3	3
4	2	1	2	2	1	4	2
5	1	1	1	1	1	2	4

4	1	1	2	2	1	4	2
4	2	1	2	2	2	5	1
4	2	2	2	3	2	4	2
4	2	3	2	2	2	4	2
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5	2	2	2	2	2	4	2
3	2	2	1	2	3	4	2
4	1	2	2	2	2	4	2
2	4	3	2	3	2	2	4
4	2	2	2	1	2	2	4
3	3	3	2	3	2	3	3
2	4	4	2	4	2	2	4
2	4	4	2	4	3	2	4
4	4	4	3	3	2	3	3
3	4	2	1	3	2	2	4
4	3	3	3	3	2	3	3
4	2	2	2	2	1	4	2
4	4	4	4	4	2	2	4
4	2	2	1	2	2	4	2
4	2	2	2	2	3	2	4
4	4	2	2	2	2	4	2
2	4	4	4	4	3	3	3
4	2	2	1	2	2	4	2
4	2	2	2	2	2	4	2
2	5	5	4	5	5	1	5
2	3	2	3	3	2	2	4

4	1	1	2	2	1	5	1
3	3	2	2	2	2	4	2
1	3	1	3	4	2	3	3
4	3	2	2	4	2	4	2
4	2	2	3	3	2	3	3

0.6: THRESHOLD (BELOW 0.6 JUNK DATA)

0.7= DECENT

0.8= GOOD

>= 0.85= OUTSTANDING

CORNBACH ALPHA: IT IS LOW IF THE INTER CORELATION IS LOW

Questions are not measured in the same construct and data are not reliable

Using psst software

Steps

Open given Oslo 3 data in spss software and question

Determine the negative questions and implement reverse coding formula

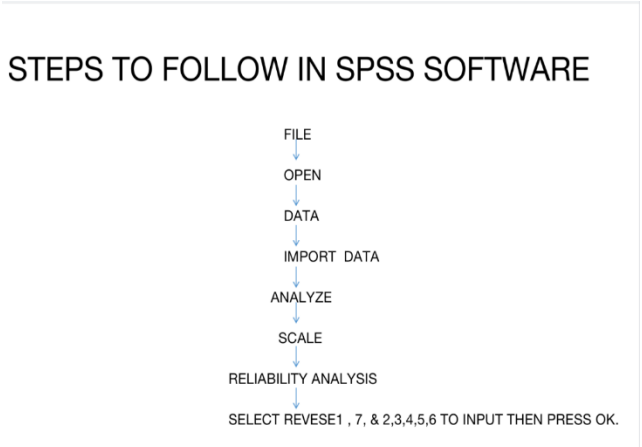
The 1 and 7 questions are negative

Reverse code is : Maximum value of scale(5)+ minimum value of scale(1)- data value type of scale is 5 point likert scale.

=5+1-2

=4

3.7.2 STEPS TO FOLLOW IN SPSS SOFTWARE



3.7.3 OUTPUT OBTAINED FROM SPSS SOFTWARE

Reliability

[DataSet2]

Scale: KELLOGGS SIMULATION LEVEL

Case Processing Summary

		N	%
Cases	Valid	61	100.0
	Excluded[a]	0	.0
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.604	7

The reliability output obtained from the data after running in to spss software is based on four concepts in to consideration, as a market researcher the best advice he or she could convict to kelloggs company is

Based on the validity of the output

Reliability shows how trustworthy is the score of the test or OSL data set group

The collected data shows the same results after being tested using SPSS and sample groups, the information is reliable with the score of .064 which is slightly above the junk data.

If your method has reliability, the results will be valid,as from the output obtained, the reliability of the kelloggs company based on cereals is comparitively low

Split-half reliability is a measure of consistency between two halves of a construct measure.The split-half reliability test is split in two halves.

the reliable values for kelloggs data seem be not consistent providing with less parsimony and reliable nature of variable even if we remove one of the variable in data set.

it is ad viced now to kelloggs company is to again have a revise of concentration over those factors towards, taste, packaging,dinner food, food for adults to. The variable (s) should be nominal or ordinal categorical.

Item Statistics

	Mean	Std. Deviation	N
osl1	3.51	.906	61
osl2	2.54	.959	61
osl3	2.39	1.021	61
osl4	2.08	.714	61
osl5	2.54	.886	61
osl6	2.08	.666	61
revosl7	2.74	.998	61

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
osl1	14.38	15.272	-.658	.831
osl2	15.34	7.163	.654	.430
osl3	15.49	7.254	.571	.460
osl4	15.80	8.827	.495	.519
osl5	15.34	7.563	.633	.449
osl6	15.80	8.794	.557	.508
revosl7	15.15	7.828	.468	.507

The simulation level of

I *like to continue using kelloggs cereal for morning breakfast* -

the reliability is excellent that has the cornbach value of above .831,it is advice to kelloggs to follow providing a quick breakfast cereals that has become one of the successful factor that drives the sales of the product

where as considering negative sales factor it seem-

I like to experience sweetness in cereals factor in kelloggs in my daily morning routine.

Here the reliability factor is to low that has the cornbach value around .430 which is below the junk data level, it is advice to kelloggs company to better avoid using the sweetness factor alone in the morning breakfast rather than concentrate on sour and spicy part also.

The osl4

I *am continually felt for new health content and quick snack experiences after consuming kelloggs cereal products.*

It is advice of positive towards kelloggs concentrating on health content more in future products of what they produce.people are expecting more of healthy factors in their breakfast routine, that can influence even the disease related patients to opt of kelloggs food, where the reliability is around .531 but can try opting to produce health benefits food.

Oslo 7-

*I prefer a change in packaging for kelloggs .**

The cornbach value for this around .508, where they to fall under junkdata, as the packaging factor is seem to be not a main factor that drives the sale ratio of kelloggs, it is advice to have a small percentage of interest alone over packaging of kelloggs product.

3.7.4 CASE 2:

Store Environment

In a Shops where kelloggs product has been placed - based on this market researcher had carried out a survey with 700+ shoppers in the city All around the world the following questions (to elicit responses regarding shopper perception of in-store lighting, assortment and employees in stores; all 5-point Likert scales) were administered:

Light

The store has good lighting for kelloggs product

The store is spaceous to accomodate more different brands of kelloggs

Lighting in the store is pleasant.

Lighting in the store was helping out to see the products even behind the shelves.

Assortment

The store has a wide variety of kelloggs products.

The store has many brands in most of the kelloggs product categories.

The store has different price ranges in kellogs

The store has front row place of kelloggs product

Employees

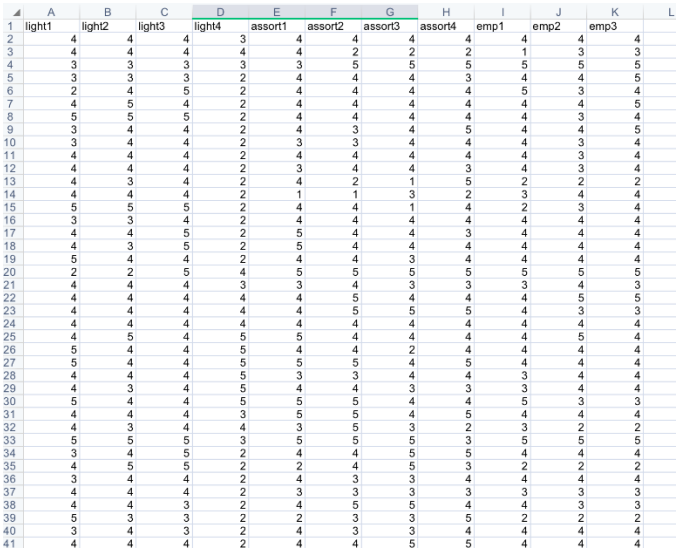
The store had educated employees

The store had friendly employees

The store had more employees to answer more customer when needed

3.7.4.1 DATA COLLECTION AFTER SURVEY

The questionnaire has been carried out in shops all over the world to around 800 consumers, and the reliability test has been carried out using spss software, to determine where there is a lack in store environment of kelloggs product that can be related to sales drive ratio of kelloggs company.



	A	B	C	D	E	F	G	H	I	J	K	L
1	light1	light2	light3	light4	assort1	assort2	assort3	assort4	emp1	emp2	emp3	
2	4	4	4	3	4	4	4	4	4	4	4	
3	4	4	4	4	4	2	2	2	1	3	3	
4	3	3	3	3	3	5	5	5	5	5	5	
5	3	3	3	2	4	4	4	3	4	4	5	
6	2	4	5	2	4	4	4	4	5	3	4	
7	4	5	4	2	4	4	4	4	4	4	5	
8	5	5	5	2	4	4	4	4	4	3	4	
9	3	4	4	2	4	3	4	5	4	4	5	
10	3	4	4	2	3	3	4	4	4	3	4	
11	4	4	4	2	4	4	4	4	4	3	4	
12	4	4	4	2	3	4	4	3	4	3	4	
13	4	3	4	2	4	2	1	5	2	2	2	
14	4	4	4	2	1	1	3	2	3	4	4	
15	5	5	5	2	4	4	1	4	2	3	4	
16	3	3	4	2	4	4	4	4	4	4	4	
17	4	4	5	2	5	4	4	3	4	4	4	
18	4	3	5	2	5	4	4	4	4	4	4	
19	5	4	4	2	4	4	3	4	4	4	4	
20	2	2	5	4	5	5	5	5	5	5	5	
21	4	4	4	3	3	4	3	3	3	4	3	
22	4	4	4	4	4	5	4	4	4	5	5	
23	4	4	4	4	4	5	5	5	4	3	3	
24	4	4	4	4	4	4	4	4	4	4	4	
25	4	5	4	5	5	4	4	4	4	5	4	
26	5	4	4	5	4	4	2	4	4	4	4	
27	5	4	4	5	5	5	4	5	4	4	4	
28	4	4	4	5	3	3	4	4	3	4	4	
29	4	3	4	5	4	4	3	3	3	4	4	
30	5	4	4	5	5	5	4	4	5	3	3	
31	4	4	4	3	5	5	4	5	4	4	4	
32	4	3	4	4	3	5	3	2	3	2	2	
33	5	5	5	3	5	5	5	3	5	5	5	
34	3	4	5	2	4	4	5	5	4	4	4	
35	4	5	5	2	2	4	5	3	2	2	2	
36	3	4	4	2	4	3	3	4	4	4	4	
37	4	4	4	2	3	3	3	3	3	3	3	
38	4	4	3	2	4	5	5	4	4	3	3	
39	5	3	3	2	2	3	3	5	2	2	2	
40	3	4	3	2	4	3	3	4	4	4	4	
41	4	4	4	2	4	4	5	5	4	4	4	

Data after survey with reference to 5 point likert scale

3.7.4.2 OUTPUT FROM SPSS SOFTWARE.

The reliability analysis has been carried out using SPSS software, the over all cornbach value of the store environment based on lighting, assortment and employees, where these become the indirect factor that is driving the sales of kelloggs company. The corn bach alpha value obtained through this analysis is .760 which falls under the decent category of reliably analysis.

Scale: KELLOGGS

Case Processing Summary

		N	%
Cases	Valid	728	99.7
	Excluded[a]	2	.3
	Total	730	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.760	11

Item Statistics

	Mean	Std. Deviation	N
light1	3.51	.846	728
light2	3.45	.833	728
light3	3.63	.797	728
light4	3.07	1.229	728
assort1	3.75	.812	728
assort2	3.66	.898	728
assort3	3.58	.877	728
assort4	3.58	.904	728
emp1	3.48	.888	728
emp2	3.54	.877	728
emp3	3.66	.893	728

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
light1	35.40	24.959	.387	.744
light2	35.46	25.460	.332	.750
light3	35.28	25.436	.358	.747
light4	35.84	27.544	-.008	.811
assort1	35.16	24.000	.539	.727
assort2	35.25	23.384	.548	.724
assort3	35.33	24.164	.465	.734
assort4	35.34	24.105	.454	.736
emp1	35.43	23.608	.527	.727
emp2	35.37	23.549	.544	.725
emp3	35.26	23.264	.567	.721

The market researcher can overall forecast the store environment factor to be quite acceptable, but some of the predictions which he can convey to the kelloggs company is that they need to opt for store outlet with more placing of kelloggs product even during the billing counter, that is the part where they people tend to buy small things at the process of waiting for billing. An advice to them is to place all those product which are under discount category in the front row shelves in the shop of cereal selling and can increase the product quantity which is selling more in that particular country or city, with reference to sale ratio, that can yield a good invitation to increase the sale of kelloggs product in forthcoming future. CAN opt a small banner of kelloggs cereals while entering the shop with sale discount that can attract customers as the reliably good cornbach alpha value that ranges around .731 as an average.And can train employees to be helpful in identifying the products based on their need to choose kelloggs over other.and in such a manner that they can explain the kelloggs product to out reach customers.

The concentration towards lighting and assortment through banners can influence the sale more when compared to employees.

3.7.4.3 TO MEASURE DEPENDENT VARIABLE AND INDEPENDENT VARIABLE SEPERATELY

Never mix dv and iv

We measure dependent variable first, we cannot lose dependent variable

Cornbach alpha is high for dependent variable

And in measure with independent variable

Measure dv and iv from the same source

This will also serve to maximize the variance in the y variable

Always pretest / pilot survey

Dummy data analysis in place

Data analysis plan in place

Counter balancing the order

Only independent variable

Counterbalancing the order of construct, do not jumble

Order of the terms is not proper then the badness of measurement will not be evenly distributed

3.8 Case 3: EXPERIMENTAL DESIGN- ANOVA, ANALYZING INTERACTING EFFECT

3.8.1 A tabulation below to describe the difference between experiment and survey with comparison and context.

	EXPERIMENT	SURVEY
1	Manipulate the X variable resea rch method measure of both x a nd y variables	only measure ment of x an d y variable
2	to include variance in X	Variance occ urs naturally
3	Lab settings	Real world
4	exploratory casual research	descriptive re search
5	x causes y- co-variation or co-relation` Co-variation: concomitant variatio n along with variation in X wit h respect to Y corelation: standrdized covari ation Temporality: X1 has to come fi rst in order of time, where X2, X3,X4,.....Xn are made constan t	
6	S ample size are smal	sample size a re large
7	Maximize varience through stre ngth of manupulation	Maximize va riance throug h heterogenity
8	subjects	respondant

To expain the ANOVA USING SPSS TOOL, WITH REGARDS WITH DEPANDENT AND INDEOENDENTS X AND Y FACTORS

hypothesis1: sales promotion is inversly related with brand

SUNSILK: LOW ON SALES

CHIC : HIGH ON SALES

hypothesis1: sales promotion is inversly related with brand

SUNSILK: LOW ON SALES

CHIC : HIGH ON SALES

	BRAND IMAG E	SALES PROMOTIO N
1CHI	2	4
2CHI	2	5
3CHI	1	5
4SUN	4	1
5SUN	4	2
6SUN	5	2

TABULATION : TO DETERMINE WHICH FACTOR DRIVES SALE FOR SHAMPOO IN DIFFERENT BRANDS USING ANOVA IN SPSS

3.8.2 INTERNAL VALIDITY & EXTERNAL VALIDITY

INTERNAL VALIDITY: Confidence with which one can state that a particular variable X1 drives Y, not X2, NOT X3

EXTERNAL VALIDITY: Confidence with which one can extrapolate the results to the rest of the population

	EXPERI MENT	SURVEY
IV	HIGH	LOW(EXTERNAL FA CTORS DRIVE MORE)
DV	LOW	HIGH(SAMPLE SIZE REAL WORLD)

TABULATION: THE ROLE DV AND IV VARIABLE IN TERMS OF EXPERIMENT AND SURVEY

which and when to adopt experiment or survey?

	EXPERIMENT	SURVEY
	New change the effect consumer find difficult to articulate the effect of X variable f elt at sub consious level	existing product we do survey sample is high i n real world

both, experiment and survey

political correctness

find it difficult to guessimate e.g: coupon or bonus pack

when you want to see yourself a result

data in real time, not towards bias methods, need to adopt both ex: survey

3.8.3 ANOVA- Analysis of variance

purpose: to test the difference across the group

TO DEtermine nature of X AND Y variable

when there are more than or equal to two groups

When nature of Y variable is metric and nature of X variable is categorical

ENSURE randomly assign diffrential scale increase, units of scale increase

to determine dependent and independent variable

ratio: dependent variable

nominal: categorical and continuous

3.8.3.1 SPSS Software has been used to determine the variance between the columns and between the group variables.

spss computes the variable within the groups

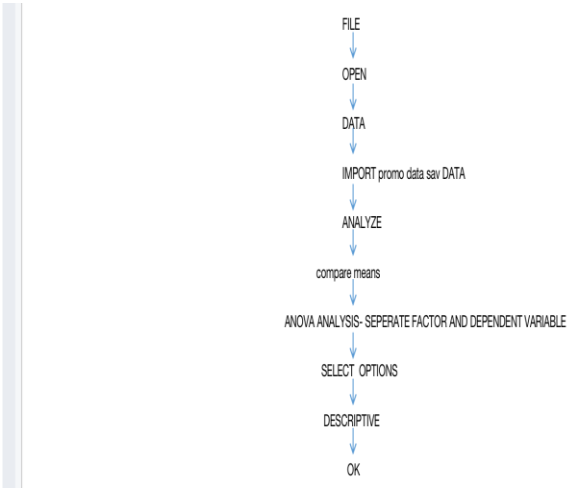
divides the between the group variables, we can reject the null hypothesis, if the given values are not equal and it does not varies within the groups and varies with in the columns

variables are from same groups, and differ across columns

between group/ within group= F RATIO

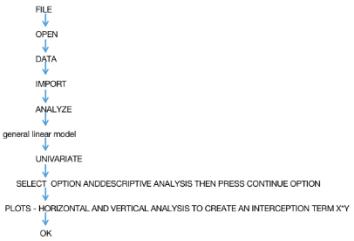
F STATISTICS STATES THAT IS GOVERNED BY F DISTRIBUTION F TABLE VALUES AND CRITICAL VALUES

3.8.3.2 ANOVA IN SPSS



ANOVA IN SPSS

• STEPS



3.8.3.3 CONDITIONS TO DETERMINE VARIANCE WITHIN GROUPS USING ANOVA IS SIGNIFICANT OR NOT

ALPHA > 0.05

GREATER THAN 0.05 IT IS STATISTICALLY INSIGNIFICANT, THERE IS NO DIFFERENCE

WE REJECT TO FAIL NULL HYPOTHESIS NO EVIDENCE

ALPHA IS < 0.05

statistically significant different

we reject null hypothesis.

3.8.4 USING ANOVA ANALYSIS FOR KELLOGGS PRODUCTS.

As stated above kelloggs company lags with sales promotion in terms of ad, so now it has to concentrate more on improvising and considering sales promotion for future benefits to the company.

Kelloggs company HAS to now concentrate on what factors that drives the sales marketing to improve their overall brand image and name reputation. Hence to determine the ways they have decided to opt for sales promotion and merchandising, and wanted to know which can reach the consumer the most, with need of market researcher here, they consulted him and asked for an advice to opt which way they can follow for promotion of marketing of all kelloggs product, where if the failure occurs could lead them a loss in more percentage ratio, which can over burden the profit terms of company internally as well as the name of the company goes with this negative decision.

Market researcher decided to conduct a survey and he has adviced to carry out this survey in those places where the sales quotient is high and wanted to analyse the result using this spss tool and obtain a idea so that it can implemented in those areas where the kelloggs sales ratio are less.,Hence, they select 80 stores and experiment on these 80 stores. In the first 20, they use neither SP or merchandising; in the next 20, only SP, no merchandising; in the next 20, only merchandising and in the last 20, they use both. They measure sales.

Collection of data after survey- kelloggs company sales.

	merchand	promo	sales	weather
1	1	0	10	4.00
2	1	0	15	5.00
3	1	0	12	4.00
4	1	0	14	4.00
5	1	0	15	4.00
6	1	0	15	4.00
7	1	0	12	4.00
8	1	0	10	4.00
9	1	0	9	3.00
10	1	0	12	4.00
11	1	0	14	4.00
12	1	0	11	4.00
13	1	0	9	4.00
14	1	0	16	4.00
15	1	0	12	4.00
16	1	0	12	4.00
17	1	0	12	4.00
18	1	0	12	3.00
19	1	0	12	4.00
20	0	0	4	2.00
21	0	0	3	2.00
22	0	0	3	2.00
23	0	0	3	1.00
24	0	0	3	2.00
25	0	0	3	3.00
26	0	0	2	2.00
27	0	0	5	3.00

Statistical output by spss software

The below output obtained from SPSS software depicts the intercept value of merchandising and sales promotion which seem to highly significant as falls under the value <0.05.it is better we reject null hypothesis and would recommend kellogs company to concentrate in sales factors.

From our survey we would like to advice that the sales of the given ratio has been depicted using merchandising and promotion.

The promotion has been carried with the dependent factor sales that along with independent factor merchandising, the percentage in terms of ratio between the two factors has not been idealized which led the consultants to be in confused state, in order to gain that clearance in those sales and merchandising, it is advisable to determine the sales promotion and merchandising intercept factor, which in or out gave a significant value

When we compared our sales promotion opting for only merchandising in terms of profit ratio, the output depicts that it gives the mean value of 12.32, where that has very low mean value comparitively if we opt for only promotion, the sales are derived with the mean value around 9.55 which is very low.

So the advice while considering only two independent factor like sales promotion and merchandising, we would suggest that it is a unwise decision to opt only one method to improve sales in kelloggs company, where as when we consider both merchandising and sales promotion we could see that depicted value obtained is around 25.30. hence considering the values obtained, it is advice for the kelloggs company to opt for both promotion and merchandising in order to obtain a huge profit in sales.while considering the external factors such as weather there can be of changing of decision when needed to concentrate more on any one factor that can drive the sales factor, in those scenarios it is advice to opt for merchandising rather than sales promotion as they both have a very vast differents mean value, and opting for merchandising is a wise decision only with respect to external factors.

Descriptive Statistics

Dependent Variable: sales

Merchandising	Promotion	Mean	Std. Deviation	N
No Merchandising	No Promotion	3.80	.834	20
	Yes Promotion	9.55	.826	20
	Total	6.67	3.025	40
Yes Merchandising	No Promotion	12.32	2.056	19
	Yes Promotion	25.30	4.791	20
	Total	18.97	7.531	39
Total	No Promotion	7.95	4.577	39
	Yes Promotion	17.43	8.667	40
	Total	12.75	8.396	79

Tests of Between-Subjects Effects

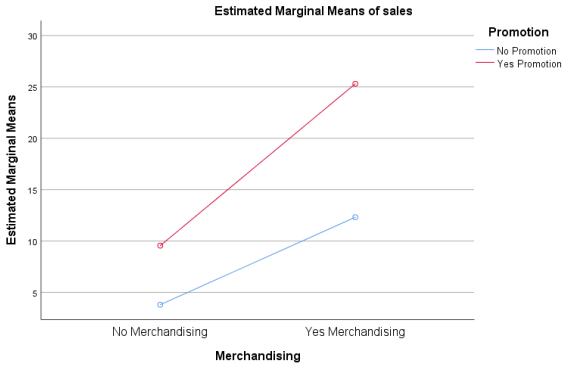
Dependent Variable: sales

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4960.481[a]	3	1653.494	230.311	.000
Intercept	12818.889	1	12818.889	1785.509	.000
merchand	2905.907	1	2905.907	404.756	.000
promo	1732.063	1	1732.063	241.254	.000
merchand * promo	258.271	1	258.271	35.974	.000
Error	538.455	75	7.179		
Total	18335.000	79			
Corrected Total	5498.937	78			

a. R Squared = .902 (Adjusted R Squared = .898)

The graphical representation below explained two parallel lines which has some positive as well as negative interception effect, where the merchandising has a greater influence over sales promotion. The more the merchandising driving the sales , the negative blue line portrays how the sales will be without merchandising in terms of sales.

Statistical output using spss- ANOVA



Kellogs company and its comparative advertising strategy

The kelloggs company has got a clear picture in opting for both merchandising and sales promotion when it comes in terms with sales, but still they lag in advertising their products, for now they have adopted a strategy where they can use any one comparative advertising, as we already have different terms when it comes to adopt a advertising strategy, it is difficult to choose between them with respect to sales promotions.

Prior to note that kelloggs lag in ad strategy, it is the market researches considering their lag in those areas decided to carry out an survey, as there is a small confusion in which method to adopt between sales promotion and comparative AD, So they carry out a small experiment. In a little less than 60 cities that they sell their products in, they systematically vary CA and SP in the following fashion. In 15 cities, they have neither SP nor CA, in the next 15, they have SP but no CA, in the next 15, they have CA but no SP and finally in the last 15, they have both SP and CA. One city's data are ignored due to measurement issues.

From the data collected from survey it has now been fed those data to spss software and they have analyzed it with the command of ANOVA. Hence annova option has been used to run the Data collection from survey, and can be utilized for future output in adopting the com ad or sales.

	compad	promo	sales	var	var	var	var
1	1	-1	10				
2	1	-1	11				
3	1	-1	12				
4	1	-1	11				
5	1	-1	15				
6	1	-1	12				
7	1	-1	11				
8	1	-1	8				
9	1	-1	12				
10	1	-1	11				
11	1	-1	10				
12	1	-1	9				
13	1	-1	12				
14	1	-1	13				
15	-1	1	10				
16	-1	1	12				
17	-1	1	11				
18	-1	1	9				
19	-1	1	12				
20	-1	1	11				
21	-1	1	10				
22	-1	1	9				
23	-1	1	11				
24	-1	1	12				
25	-1	1	12				
26	-1	1	13				
27	-1	1	11				

SPSS SOFTWARE OUTPUT

Descriptive Statistics

Dependent Variable: Sales Per Day

Promotion	Comparison Ad	Mean	Std. Deviation	N
No	No	7.94	.680	16
	Yes	11.21	1.718	14
	Total	9.47	2.080	30
Yes	No	10.93	1.207	14
	Yes	10.40	1.639	15
	Total	10.66	1.446	29
Total	No	9.33	1.788	30
	Yes	10.79	1.698	29
	Total	10.05	1.879	59

Tests of Between-Subjects Effects

Dependent Variable: Sales Per Day

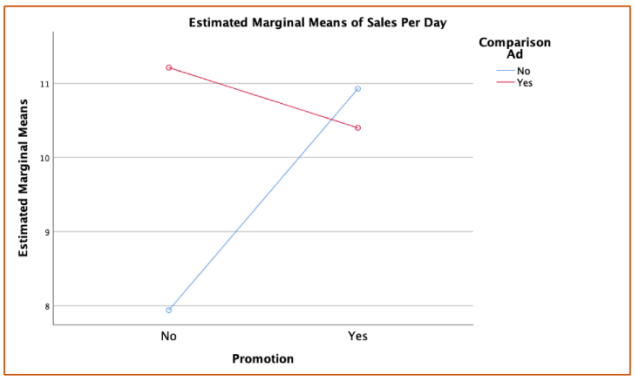
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	103.024[a]	3	34.341	18.550	.000
Intercept	6023.955	1	6023.955	3253.851	.000
promo	17.419	1	17.419	9.409	.003
compad	27.765	1	27.765	14.997	.000
promo * compad	53.233	1	53.233	28.754	.000
Error	101.823	55	1.851		
Total	6165.000	59			
Corrected Total	204.847	58			

a. R Squared = .503 (Adjusted R Squared = .476)

From the data obtained above we could clearly understand that the company has to opt for only comparative advertising rather than sales promotion, the ratio between the two independent variable when considering the compad it been seen that the mean value for opting compad value is 11.21, where as the for promotion the mean value is 10.40 where the ratio is less when compared to opting for compad strategy.

But it is adviceble for kelloggs comp-any to opt for both compad and sales promo as they both together can surely ensure in providing some positive connotations with respect to sales increase in the company.

Profile Plots



The above graphical representation depicts some negative interaction in terms of sales promotion and compad, as the both line intercept and they do have a terms of negative aversion between sales in the kelloggs company. The company market researcher should now advice the company to follow a methodology to choose COMPAD as a priority with respect to SALES PROMOTION strategy, but choosing both is a smart way to drive up the sales.

It has been so tough to decide to adopt any one strategy as both shows a minute difference in choosing which can influence the sale in kellogs, it is better to carry out the effective size methodology to compute those values to determine which method to opt in advertising to increase the sales ratio of kelloggs company.

Description	Comp Ad	Promotion
F test Value (F)	14.997	9.409
No of Groups (k)	2	2
No of Respondent/Group (n)	29.5	29.5
ω2	0.191	0.124
Effect size	(14.997-1)*(2-1)/ (14.997-1)*(2-1)+(2*29.5)	(9.409-1)*(2-1)/ (9.409-1)*(2-1)+(2*29.5)

KELLOGS COMPANY ADVERTISING STRATEGY

From the data obtained above and choosing to opt for a comparative ad strategy, it is now the kelloggs company has to decide which to prefer between the ad methods to our knowledge of researcher there are 4c types of comparative ad strategy namely

Direct market leader

Indirect market leader

Direct multi brand ad

Indirect multi brand ad

Now there comes the confusion to the people of kelloggs company to choose between them, in order to clear this confusion the market researcher of kelloggs company suggested to carry out an survey to determine a solution to choose one between these.

Comparative Advertising .

The kelloggs company has now advanced its advertisers to choose any one method based on that particular country standards, it may vary from one country to another, hence it is advice to all the kelloggs family advertiser to opt for a change in method of advertising based on our competitor strength and weakness for that particular situations, hence to determine this a survey has been carried out as Recently, there has been a huge upsurge in comparative advertising where a brand compares itselfwith another or sometimes a few others. Advertisers are still unsure about using comparative advertising. One way of gauging an ad's effectiveness is by checking its perceived manipulative intent. Lower this is, better is the ad.

Descriptive Statistics

Dependent Variable: Users of Comparison Brand

Comp ad format	Comparison Strategy	Mean	Std. Deviation	N
Indirect	Multi Brand	.5102	.50508	49
	Market Leader	.7021	.46227	47
	Total	.6042	.49160	96
Direct	Multi Brand	.6122	.49229	49
	Market Leader	.6600	.47852	50
	Total	.6364	.48349	99
Total	Multi Brand	.5612	.49879	98
	Market Leader	.6804	.46874	97
	Total	.6205	.48651	195

Tests of Between-Subjects Effects

Dependent Variable: Users of Comparison Brand

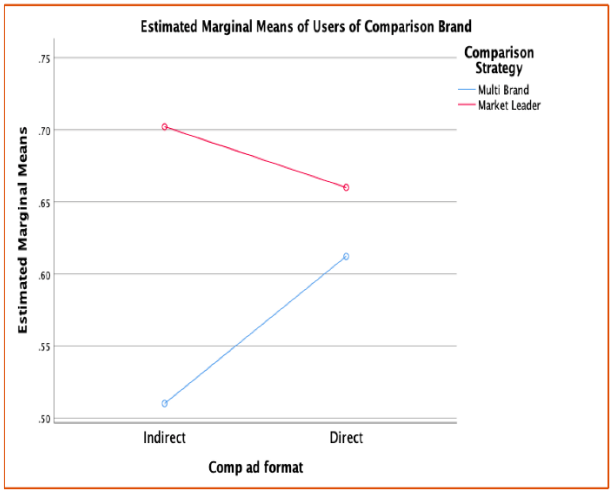
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.991[a]	3	.330	1.404	.243
Intercept	75.197	1	75.197	319.685	.000
compadfo	.044	1	.044	.186	.667
compstra	.700	1	.700	2.975	.086
compadfo * compstra	.253	1	.253	1.076	.301
Error	44.927	191	.235		
Total	121.000	195			
Corrected Total	45.918	194			

a. R Squared = .022 (Adjusted R Squared = .006)

The intercept between the compad and strategy is highly significant, it is adviced for the kelloggs company should opt for both direct market leader has influence around (66%)and indirect multi brand.(53%). the lower the manupulative indent, higher is the ad quality of camp.

This concept of adopting the comparative ad strategy can influence the sales ratio of the comapny. It is advice by the researcher to the company that they go for both market strategy of comparative ad and can enhance those indicators towards the growth of sales in the company ,the graphical representation could make us understand that both indirect market leader and direct multibrand can enhance the sales of the company and both are considerably parallel with each other and thus can produce a positive attitude towards increasing the sales ratio of the comapny directly or indirectly. In general the negative context of choosing other two may some time create a scenario that is well averse with the ratio of choosing a wrong or less influential compad ad strategy by kellogs as they both can create a loss in sales if when adopted.

Profile Plots



Kelloggs REGRESSION IN SPSS TO ANALYSE THE LINEAR RELATION BETWEEN THE VARIABLES

The purpose of regression is to determine the linear relation between the variable X Y.the role of regression in determining the error in those linear relations between the variables X Y , in order to obtain a prediction for most related component of x and y.

There are two types of regression

Simple regression: where it relates the variable X and Y

Multiple regression: It possess many x variable and only one Y is more or less large and varied.

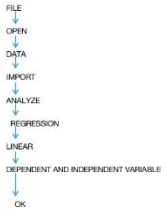
From the X we work backwards to derive y

Nature of y should be continuous and metric

Nature of x should be continuous and categorical

STEPS THAT NEED TO BE FOLLOWED IN ORDER TO PERFORM REGRESSION IN SPSS SOFTWARE IS

• STEPS



The major information we obtain from ANOVA Regression output is that,

Is there any linear relation between X and Y

The bunch of X able is it doing a good job in terms of y variable

Overall the regression is statistically significant

Some of the general criteria through which p value in regression is been depicted that is

ANNOVA P <= TO 0.05 YES IT HAS SIGNIFICANT VALUE

ANNOVA P>= 0.05 NO ITS VALUE IS NOT SIGNIFICANT.

To determine the strength of relation, P is not significant,model summery strength of extent of linear relation.

Coefficient of determination where the value of adjusted Rsquare has been obtained.

In spss the adjusted r square in relioable statistics has the tendency of the researcher to artificially inflated r square by adding variable after variable.

The R square is impacted by the choice of research method. Experiment is low and survey is high.

In most of the experiment the threshold of square is below or above

It is survey when R square is high

And it is experiment if the square is low.

In general the experiment r square is considered to be bad

Y=mx+c is the standard regression equation where the prediction of y variable happens with respect to x and a constant to obtain a accurate result of linear relationship that drives the reason towards success or failure.

While with consideration to kelloggs company, the main factors related with linear relation has been made with respect to sales, customer, dealers, salesperson etc. It is important to determine how they are linearly co-related with the equation of regression to predict the main factor of x and y to determine the regression solution to those factors. In-order to determine the potential sales data it is based on raw data on with standardized data.

To determine the sales potential of KELLOGGS, it is required to obtain the coefficient of determination in terms of r square which includes sales, dealers and other variables of x which can be determined by using multi regression method.

Now the kelloggs company has decided to expand its sales ratio by expanding its market in various country , hence it is thinking to determine the mode of sales dealers, competitors, sales potential, sales people and service people of the company measures sales in 15 different regions of the country. A priori, they have the following hypotheses:

H1: There is a positive relationship between sales potential of an area/region and sales.

H2: There is a positive relationship between the number of dealers and sales.

H3: There is a positive relationship between number of sales people and sales.

H4: There is a negative relationship between level of competition and sales.

H5: There is a positive relationship between number of service people and sales.

H6: There is a positive relationship between the number of customers and sales.

In order to determine the linear related factors in other terms the strength with which each factors or variables related with each other plays a major role in determining the efficiency of workable factor of sales ratio in kelloggs company.

We obtained a very high R square WHICH COMES UNDER SURVEY CATEGORY.

Regression

[DataSet7] /Users/Shared/Previously Relocated Items 1/practice data/regression data1.sav

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	No of Dealers, Competitive activity, No of Service People, No of Salespeople, No of Customers, Sales Potential[b]	.	Enter

a. Dependent Variable: Sales

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.972[a]	.945	.904	6.822

a. Predictors: (Constant), No of Dealers, Competitive activity, No of Service People, No of Salespeople, No of Customers, Sales Potential

b. Dependent Variable: Sales

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6387.386	6	1064.564	22.873	.000[b]
	Residual	372.347	8	46.543		
	Total	6759.733	14			

a. Dependent Variable: Sales

b. Predictors: (Constant), No of Dealers, Competitive activity, No of Service People, No of Salespeople, No of Customers, Sales Potential

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-6.618	8.987		-.736	.483
	Sales Potential	.282	.130	.546	2.170	.062
	No of Customers	-.095	.315	-.073	-.303	.770
	No of Service People	1.438	2.171	.107	.662	.526
	Competitive activity	-.520	2.083	-.023	-.250	.809
	No of Salespeople	.039	.277	.025	.141	.892
	No of Dealers	2.170	.942	.435	2.305	.050

a. Dependent Variable: Sales

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.09	70.94	23.47	21.360	15
Residual	-11.207	10.062	.000	5.157	15
Std. Predicted Value	-1.048	2.222	.000	1.000	15
Std. Residual	-1.643	1.475	.000	.756	15

a. Dependent Variable: Sales

BETA value is the sign magnitude of particular equation, greater the magnitude of particular variable compared to other variable,higher the competition lower the sales.

As 0.62 increase in no of dealers, it is positive relation, go to the areas where sale potential is high, appoint more and more dealers, sales potential is high.

In order to obtain an un standardized equation we get

-6.618+0.282+2.17+0.039-0.52+1.438-0.095= standardized equation for sales quotient in kelloggs comapny.

Higher the value of standardized equation higher is its magnitude and vice verse

The standardized coefficients with respect to beta that includes the below equation

.546+(-0.73)+.107+(-0.23)+.025+.435

The strength of relation between the variables lies between the higher magnitude with the variable of linear equation added along with constant , the demonstration of linear regression equation is said to be Y=MX+C

The main strength of kelloggs company when it comes to sale is the service people and sales people , sales potential and dealers. These three has very high positive magnitude of strength relation between other factors.in other way the competitive factor and customer do create a negative impact in sales quotient in kelloggs company.

The market researcher of the company should recommend that the competitor analysis and customer driven areas are those in which they should concentrate more.

After determining the sales potential, kelloggs comapny has a wide doubt in relating it with acceptance for cereal and with respect to its taste, smell, quantity, quick snack.

A retailer wants to know if store preference is impacted by above factors of the merchandise kept in stores. So the management systematically conducted a survey to relate it with determining which factor plays a major part in sales with cereal of kelloggs.

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	ready to eat- instant food, amount, taste, smell[b]	.	Enter

a. Dependent Variable: Preference for cereal

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.960[a]	.922	.901	.59722

a. Predictors: (Constant), ready to eat- instant food, amount, taste, smell

b. Dependent Variable: Preference for cereal

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.200	4	15.800	44.298	.000[b]
	Residual	5.350	15	.357		
	Total	68.550	19			

a. Dependent Variable: Preference for cereal

b. Predictors: (Constant), ready to eat- instant food, amount, taste, smell

In order to determine the linear related factors in other terms the strength with which each factors or variables related with each other plays a major role in determining the efficiency of workable factor of sales ratio in kelloggs company.

We obtained a very high R square WHICH COMES UNDER SURVEY CATEGORY.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.254	.517		.492	.630
	taste	.059	.156	.037	.380	.709
	smell	.057	.114	.049	.499	.625
	amount	.030	.099	.028	.308	.763
	ready to eat- instant food	.970	.114	.891	8.472	.000

a. Dependent Variable: Preference for cereal

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.5518	6.9246	3.8500	1.82382	20
Residual	-1.57771	.44818	.00000	.53064	20
Std. Predicted Value	-1.260	1.686	.000	1.000	20
Std. Residual	-2.642	.750	.000	.889	20

a. Dependent Variable: Preference for cereal

BETA value is the sign magnitude of particular equation, greater the magnitude of particular variable compared to other variable,higher the competition lower the sales.

As 0.62 increase in no of dealers, it is positive relation, go to the areas where sale potential is high, appoint more and more dealers, sales potential is high.

In order to obtain an un standardized equation we get

.254+.059+.057+.030+.970= standardized equation for sales quotient in kelloggs comapny.

Higher the value of standardized equation higher is its magnitude and vice verse

The standardized coefficients with respect to beta that includes the below equation

.037+.049+.028+.891 The strength of relation between the variables lies between the higher magnitude with the variable of linear equation added along with constant , the demonstration of linear regression equation is said to be Y=MX+C

The main strength of kelloggs company when it comes to sale of cereal is the read to eat instant food concept and taste along with smell. These three has very high positive magnitude of strength relation between other factors.in other way the quantity of kelloggs cereal do create a negative impact in sales quotient in kelloggs company.

The market researcher of the company should recommend that the kelloggs company should concentrate more on quantity of cereals.

NEED OF DUMMY VARIABLE IN REGRESSION ANALYSIS

A KELLOGGS retailer of CEREAL;for Childrens wants to know what drives the preference for saris among school kids and childrens. After some qualitative research, the retailer identifies taste(some are greater preferred vis-à-vis others), price and quality as likely drivers of preference towards kelloggs cereals. On a particular day, he gets data from 30 customers. The data are in the file “sari preference dummy data.sav”.

	cerealpref	taste	price	quality	VAR00001	VAR00002	PRE_1	PRE_2
1	5.00	1.00	500.00	3.00	.00	.00	3.82745	4.56097
2	5.00	1.00	450.00	4.00	.00	.00	3.99802	4.62177
3	5.00	1.00	323.00	4.00	.00	.00	4.00846	4.57761
4	4.00	1.00	450.00	3.00	.00	.00	3.83156	4.54358
5	5.00	1.00	250.00	3.00	.00	.00	3.84800	4.47405
6	4.00	1.00	1000.00	3.00	.00	.00	3.78636	4.73479
7	5.00	1.00	500.00	3.00	.00	.00	3.82745	4.56097
8	4.00	1.00	650.00	3.00	.00	.00	3.81512	4.61311
9	5.00	1.00	750.00	4.00	.00	.00	3.97337	4.72606
10	4.00	1.00	800.00	2.00	.00	.00	3.63633	4.58708
11	2.00	2.00	650.00	3.00	1.00	.00	3.13972	1.67574
12	2.00	2.00	560.00	4.00	1.00	.00	3.31358	1.72263
13	2.00	2.00	750.00	3.00	1.00	.00	3.13150	1.71051
14	1.75	2.00	550.00	3.00	1.00	.00	3.14794	1.64098
15	2.00	2.00	1000.00	3.00	1.00	.00	3.11096	1.79742
16	1.50	2.00	300.00	4.00	1.00	.00	3.33495	1.63224
17	1.45	2.00	250.00	2.00	1.00	.00	3.00613	1.45850
18	1.00	2.00	300.00	4.00	1.00	.00	3.33495	1.63224
19	1.00	2.00	900.00	3.00	1.00	.00	3.11918	1.76265
20	2.00	2.00	850.00	2.00	1.00	.00	2.95682	1.66709
21	4.00	3.00	1000.00	3.00	.00	1.00	2.43556	3.38820
22	4.00	3.00	800.00	4.00	.00	1.00	2.61846	3.39685
23	3.00	3.00	675.00	3.00	.00	1.00	2.46226	3.27521
24	3.00	3.00	500.00	4.00	.00	1.00	2.64311	3.29256
25	3.50	3.00	400.00	2.00	.00	1.00	2.31840	3.10143
26	2.75	3.00	350.00	4.00	.00	1.00	2.65544	3.24041
27	2.50	3.00	400.00	3.50	.00	1.00	2.56810	3.21870

The basic criteria to run a regression method is based on its statistical significance towards the f ratio value, but in this case when in concentrating kelloggs cereal the taste, price and quality of food plays a major role, but the survey has been carried out within 30 customers, so the value obtained should be categorical but it is continuous, hence in order to obtain a significant value we have just implemented a dummy regression methodology, variable 1 and 2 as we have 3 factors to determine the sales preference, it is advice to add (N-1) dummy variable that is (3-1)=2 dummy variable, where i have kept the quality 1 cereal as baseline, hence it is the other factors where i have apply 1 as a dummy constant under the procedure of dummy variable regression.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	quality, taste, price[b]	.	Enter

a. Dependent Variable: kellogs cereal
b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.438[a]	.192	.099	1.23942

a. Predictors: (Constant), quality, taste, price
b. Dependent Variable: kellogs cereal

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.499	3	3.166	2.061	.130[b]
	Residual	39.940	26	1.536		
	Total	49.439	29			

a. Dependent Variable: kellogs cereal
b. Predictors: (Constant), quality, taste, price

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4.045	1.509		2.680	.013
	price	-8.218E-5	.001	-.014	-.080	.937
	taste	-.675	.277	-.430	-2.437	.022
	quality	.166	.356	.084	.468	.644

a. Dependent Variable: kellogs cereal

The strength of relation P value is not significant, model strength summery of extent of linear relation, coefficient of determination r^2 is 0.192 which is considerably low, with the data obtained below, variables themselves are not significant with respect to sari preference.

Here in our data given, the sari preference has been analysed, where to infer the linear relation between the variables X of preference in cereal and y which shows greatest error,the lowest is the error the greatest the explanatory which has been computed with the equation of regression Y=MX+C, where X is the variation , but unfortunately the obtained p value in data is not significant P=.130(P>O.O5).

To obtain R^2, after variance in the Y variable, how much explained in X variable is called R^2, Other wise termed as explained variance R^2, coefficient of determination.The adjusted R^2 =0.192 can be highly inflated with addition of more variables, where in this case variable themselves are not significant. As the value of R^2=0.192 which is said to be low, it comes under experiment category,

To obtain an standardized equation =2.3184+(-2.33495)+(-1.494)+(-1.884)= the value of Y.

The residual value obtained is none other than the squares of error, which clearly states that,

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4.045	1.509		2.680	.013
	price	-8.218E-5	.001	-.014	-.080	.937
	taste	-.675	.277	-.430	-2.437	.022
	quality	.166	.356	.084	.468	.644

a. Dependent Variable: kellogs cereal

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.3184	4.0085	3.1733	.57231	30
Residual	-2.33495	1.56444	.00000	1.17356	30
Std. Predicted Value	-1.494	1.459	.000	1.000	30
Std. Residual	-1.884	1.262	.000	.947	30

a. Dependent Variable: kellogs cereal

It would be of advice to the RETAILER person of KELLOGGS, to concentrate more on Quality & price, as both are highly significant in terms of pearson correlation, where the value is -.018, when compared with color and price= 0.000 which is significant. The sales in that particular day, can be greatly influenced by quality & price of the kelloggs cereal when compared to taste, hence it is advisable for the sales person to concentrate more on quality and price when compared to taste which is very less significant compared to price and color.

➔ **Correlations**

Correlations

		kellogs cereal	taste	price	quality
kellogs cereal	Pearson Correlation	1	-.429*	-.024	.087
	Sig. (2-tailed)		.018	.899	.647
	N	30	30	30	30
taste	Pearson Correlation	-.429*	1	-.018	.000
	Sig. (2-tailed)	.018		.926	1.000
	N	30	30	30	30
price	Pearson Correlation	-.024	-.018	1	-.207
	Sig. (2-tailed)	.899	.926		.272
	N	30	30	30	30
quality	Pearson Correlation	.087	.000	-.207	1
	Sig. (2-tailed)	.647	1.000	.272	
	N	30	30	30	30

*. Correlation is significant at the 0.05 level (2-tailed).

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	VAR00002, quality, price, VAR00001[b]	.	Enter

a. Dependent Variable: kellogs cereal
b. Tolerance = .000 limit reached.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935[a]	.874	.854	.49859

a. Predictors: (Constant), VAR00002, quality, price, VAR00001
b. Dependent Variable: kellogs cereal

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.224	4	10.806	43.468	.000[b]
	Residual	6.215	25	.249		
	Total	49.439	29			

a. Dependent Variable: kellogs cereal
b. Predictors: (Constant), VAR00002, quality, price, VAR00001

Create N-1 dummy variable, where N stands for No. Of categories that are categorical X variable category.we would suggest to create 2 dummy variables with respect to TASTE , as number of categories of TASTE specified is kelloggs corn flakes, musile, frosted flakes.

As we analyzed , we obtained, the value of R square as .997, and adjusted R square nis .963. where the result obtained is highly significant

Regression analyses with respect to dummy variable

Analyse the data and advise the retailer.

The strength of relation P value is not significant, model strength summery of extent of linear relation, coefficient of determination r^2 is 0.874 which is considerably high, with the data obtained below, variables themselves are not significant with respect to kelloggs cereal.

Here in our data given, the kelloggs cereal preference has been analysed, where to infer the linear relation between the variables X of preference in sari and y which shows greatest error,the lowest is the error the greatest the explanatory which has been computed with the equation of regression Y=MX+C, where X is the variation , but unfortunately the obtained p value in data is significant P=.000(P<O.O5).

KELLOGS CORN FLAKES AS BASE LINE

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935[a]	.874	.854	.49859

a. Predictors: (Constant), taste, quality, price, VAR00002

b. Dependent Variable: kellogs cereal

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.224	4	10.806	43.468	.000[b]
	Residual	6.215	25	.249		
	Total	49.439	29			

a. Dependent Variable: kellogs cereal

b. Predictors: (Constant), taste, quality, price, VAR00002

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	7.090	.661		10.726	.000
	VAR00002	4.528	.389	1.663	11.647	.000
	quality	.078	.143	.040	.545	.590
	price	.000	.000	.061	.838	.410
	taste	-2.937	.224	-1.868	-13.117	.000

a. Dependent Variable: kellogs cereal

Kellogs cereal= 4.153+ (0*500)+(0.078*3)=4.387 = 4.4

Keeping kellogs musile as base line

the strength of relation P value is not significant, model strength summery of extent of linear relation, coefficient of determination r^2 is 0.871 which is considerably high, with the data obtained below, variables themselves are not significant with respect to kelloggs cereal.

Here in our data given, the kelloggs cereal preference has been analysed, where to infer the linear relation between the variables X of preference in sari and y which shows greatest error,the lowest is the error the greatest the explanatory which has been computed with the equation of regression Y=MX+C, where X is the variation , but unfortunately the obtained p value in data is significant P=.000(P<O.O5).

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.933[a]	.871	.856	.49572

a. Predictors: (Constant), quality, VAR00002, VAR00001

b. Dependent Variable: kellogs cereal

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.049	3	14.350	58.394	.000[b]
	Residual	6.389	26	.246		
	Total	49.439	29			

a. Dependent Variable: kellogs cereal

b. Predictors: (Constant), quality, VAR00002, VAR00001

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.503	.460		3.264	.003
	VAR00001	2.925	.222	1.074	13.166	.000
	VAR00002	1.575	.222	.578	7.089	.000
	quality	.054	.140	.027	.386	.702

a. Dependent Variable: kellogs cereal

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.6106	4.6432	3.1733	1.21838	30
Residual	-.76619	.76079	.00000	.46938	30
Std. Predicted Value	-1.283	1.206	.000	1.000	30
Std. Residual	-1.546	1.535	.000	.947	30

To obtain $\mathbf{R^2}$, after variance in the Y variable, how much explained in X variable is called $\mathbf{R^2}$, Other wise termed as explained variance $\mathbf{R^2}$, coefficient of determination.The adjusted $\mathbf{R^2}$ =0.874 can be highly inflated with addition of more variables, where in this case variable themselves are not significant. As the value of $\mathbf{R^2}$=0.874 which is said to be HIGH , it comes under SURVEY category,

Kellogs cereal=1.503+ (0*500)+(0.078*3)=4.387 = 1.737

Keeping kellogs frosted flakes as base line

the strength of relation P value is not significant, model strength summery of extent of linear relation, coefficient of determination r^2 is 0.874 which is considerably high, with the data obtained below, variables themselves are not significant with respect to kelloggs cereal.

Here in our data given, the kelloggs cereal preference has been analysed, where to infer the linear relation between the variables X of preference in sari and y which shows greatest error,the lowest is the error the greatest the explanatory which has been computed with

the equation of regression Y=MX+C, where X is the variation , but unfortunately the obtained p value in data is significant P=.000(P<O.O5).

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935[a]	.874	.854	.49859

a. Predictors: (Constant), VAR00002, taste, quality, price

b. Dependent Variable: kellogs cereal

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.224	4	10.806	43.468	.000[b]
	Residual	6.215	25	.249		
	Total	49.439	29			

a. Dependent Variable: kellogs cereal

b. Predictors: (Constant), VAR00002, taste, quality, price

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4.826	.611		7.901	.000
	quality	.078	.143	.040	.545	.590
	price	.000	.000	.061	.838	.410
	taste	-.673	.112	-.428	-6.038	.000
	VAR00002	-2.264	.194	-.831	-11.647	.000

a. Dependent Variable: kellogs cereal

To obtain $\mathbf{R^2}$, after variance in the Y variable, how much explained in X variable is called $\mathbf{R^2}$, Other wise termed as explained variance $\mathbf{R^2}$, coefficient of determination.The adjusted $\mathbf{R^2}$ =0.874 can be highly inflated with addition of more variables, where in this case variable themselves are not significant. As the value of $\mathbf{R^2}$=0.874 which is said to be HIGH , it comes under SURVEY category,

Kellogs cereal=4.826+ (0*500)+(0.078*3)=4.387 =5.06

The residual value obtained is none other than the squares of error, which clearly states that, the children prefer kellogs frosted flakes where there is the presence of more nuts and 0% sugar added to it. Children like those cereals more when compared to kellogs corn flakes, and the second most liked cereal was kelloggs musile flakes when it comes to quality 3 and price is little bit high that is around 500.

FACTOR ANALYSIS- LATENT CONSTRUCT

It is also called as principle component analysis, to reduce a large number of corelated variable to smaller set of non correlated factors.

The variable should be in the terms of

Y- CONTINUOUS

X- CATEGORICAL

There are no dependent variable in factor analysis, dependent free technique

There should not be any multi co-linearity correlation between X variable-termed as regression

Some of the basic requirement to run factor analysis is

They N size should be equal

If equal then multi co linearity will not occur.

If something on top driving all the variable related to it or to directly measure a factor from those variable with common interdependence othrt terms interaction effect

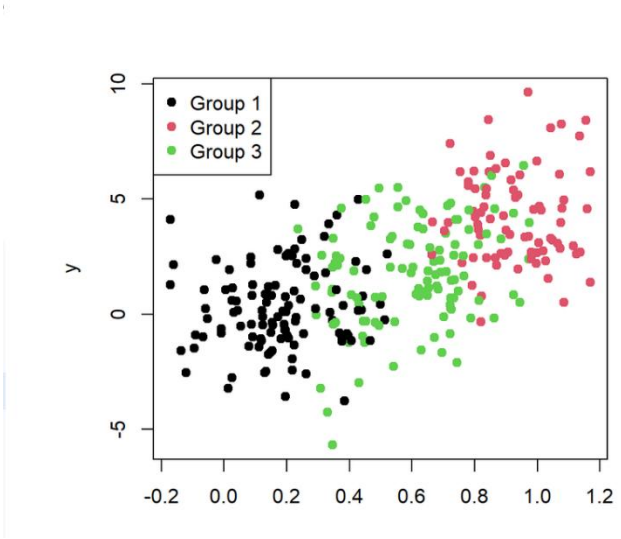
Principle behind factor analysis

Step 1: It standardizes the data, effect of unit of measurement goes away, it finds the mean and standard deviation

Standard size of data= subtracts the mean/std deviation

X-u/sigma= ZED SCORE

Step2: Using the standardized data it draws scatter plot.



Point of departure 60% variance are explained the other 40% vanishes, we cannot have more factors.

To reduce the data maximum of two factors with 5 variables, but produces less no of factors.

Another component of principle , the things whichj pc1 variance have not covered will be explained balance variable PC2.

Pc2 perpendicular to pc1

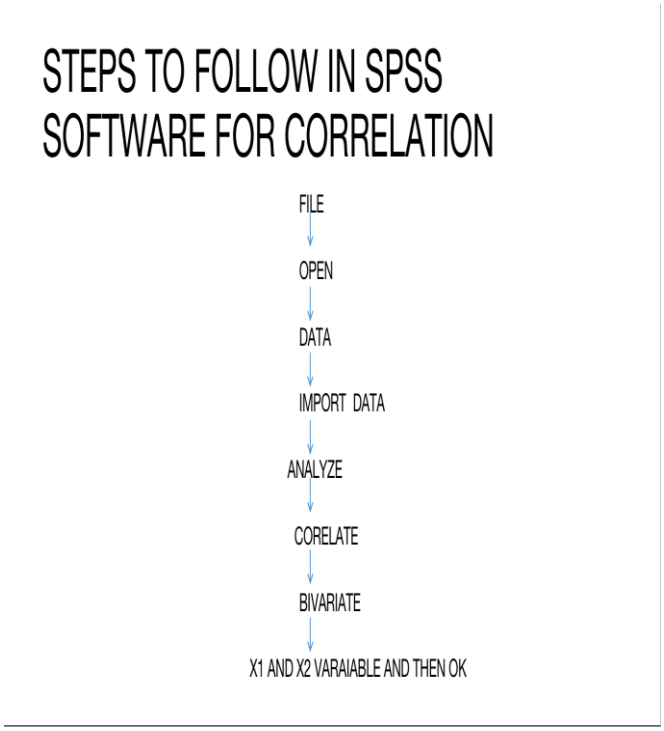
Only when the factor will be uncorrelated with one another, to demonstrate factor analysis

Using SPSS software

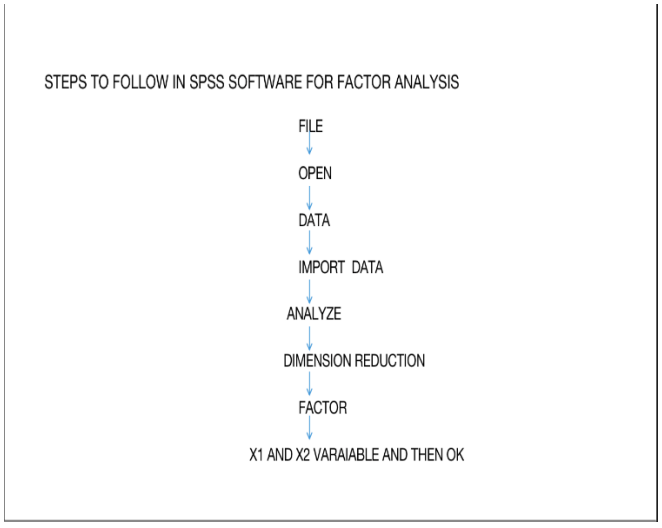
X1 AND X2

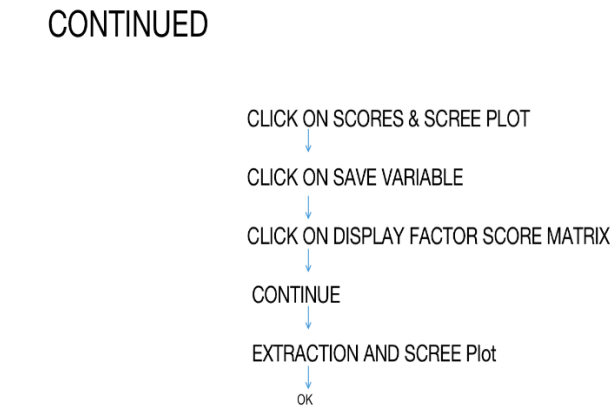
Factor analysis is complicated

Steps involved in SPSS SOFTWARE TO PERFORM INTERCORELATION



STEPS TO FOLLOW TO PERFORM FACTOR ANALYSIS USING SPSS SOFTWARE





IMPORTANT TERM DEFINITION IN EIGEN VALUE

EIGEN VALUE: variance explained by a factor in all variables put together expressed in unit terms

COMPONENT MATRIX:possibly most important part of factor analysis.it contains correlation between variable and factor, these correlation called factor loading.

the cumulative % of variance, based on convenience

Go on extracting factors, explained the cumulative percentage, of variance reaches that %

Scree plot criteria, to extract only one factor based on the Eigen value conditions,in the form of graph plot

Each eigen value explained needs to extracted with condition, which are GREATER than 1.

From our inference , we could say that there are only two factors that has the value less

THE GUIDE LINES FOR HIGH MEDIUM AND LOW MODERATE GREY AREA THEN LOW LOADING IN COMPONENT MATRIX

HIGH	MEDIUM/MODERATE LOW FACTOR LOADING
0.6 TO 1	O.45 TO 0.59 0 TO 0.44
-0.6 TO -1	-0.45 TO -0.59 -0.44 TO 0

KELLOGS company measures sales in 15 different regions of the country. A priori, they have the following hypotheses:

H1: There is a positive relationship between sales potential of an area/region and sales.

H2: There is a positive relationship between the number of dealers and sales.

H3: There is a positive relationship between number of sales people and sales.

H4: There is a negative relationship between level of competition and sales.

H5: There is a positive relationship between number of service people and sales.

H6: There is a positive relationship between the number of customers and sales.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.972[a]	.945	.904	6.822

a. Predictors: (Constant), No of Customers, Competitive activity, No of Salespeople, No of Service People, No of Dealers, Sales Potential

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6387.386	6	1064.564	22.873	.000[b]
	Residual	372.347	8	46.543		
	Total	6759.733	14			

a. Dependent Variable: Sales

b. Predictors: (Constant), No of Customers, Competitive activity, No of Salespeople, No of Service People, No of Dealers, Sales Potential

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-6.618	8.987		-.736	.483
	Sales Potential	.282	.130	.546	2.170	.062
	No of Dealers	2.170	.942	.435	2.305	.050
	No of Salespeople	.039	.277	.025	.141	.892
	Competitive activity	-.520	2.083	-.023	-.250	.809
	No of Service People	1.438	2.171	.107	.662	.526
	No of Customers	-.095	.315	-.073	-.303	.770

a. Dependent Variable: Sales

Factor Analysis

Communalities

	Initial	Extraction
Sales	1.000	.937
Sales Potential	1.000	.921
No of Dealers	1.000	.867
No of Salespeople	1.000	.768
Competitive activity	1.000	.951
No of Service People	1.000	.725
No of Customers	1.000	.869

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues Total	% of Variance	Cumulative %	Extraction Sums of Squared Loadings Total	% of Variance	Cumulative %
1	4.944	70.635	70.635	4.944	70.635	70.635
2	1.092	15.599	86.234	1.092	15.599	86.234
3	.450	6.435	92.669			
4	.292	4.172	96.841			
5	.111	1.586	98.427			
6	.078	1.117	99.543			
7	.032	.457	100.000			

Extraction Method: Principal Component Analysis.

Than one, factor 1:4.944

Factor 2: 1.092

In order to name it, factor 1: We can term that as sales department

Factor 2: Service department

Total variance explained in the table:

Pc1=70.635

Pc2:15.599

Eigen value= pc1=4.944

Pc2=1.092

Compute it from eigen value out of 100

Pc1= 100-70.635, its variance is for 1 unit, need to compute it for 2 values, that is,2/100*(70.635)=1.4127

Epc2: 100-15.599

For two units= 2/100*15.599=0.31198

Ow to compute eigen value

R= corelation

R square =.945= explained variance component matrix possess co-relation

The most important part of factor analysis it contains co-relations between the variables

And factors, these co-relation is called as factor analysis

Eigen value of pc1 - variance

Explained by factor, when all variable put together,

Epc1= var.pc1 *1 +var.pc1*2

=0.937*0.937

=1.814

Epc2= variance explained pc2x1+varpcx2

=.207*0.207+.207

=0.2498

Communalities

Variance explained in a variable by all factors put together, called communalities,

Communality is indicated by h square

Where h stands for hypotenuse,

Hsq*1= variance *1pc1+var*1pc2

=0.937*0.937+0.207*0.207

=1

Where h stands for hypotenuse,

Hsq*2= variance *1pc1+var*1pc2

=0.937*0.937+(-0.207*-0.207)

=1

Component score (coefficient matrix)

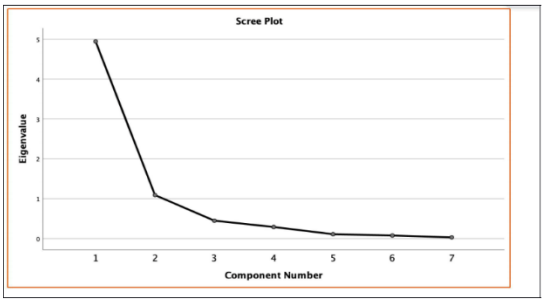
Gives the recipe for the factor,answers the question, by what weights do i have to multiply x1 and x2 to arrive at the

Factors,are there any component score of coefficient matrix

A factor is nothing but the linear combination of composite variables.

Pc1= 0.806 x 1 + 0.806 x 2

Pc2= -.275 x 1 + -.275 x 2



Component Matrix[a]

	Component 1	Component 2
Sales	.967	.040
Sales Potential	.937	.207
No of Dealers	.929	-.067
No of Salespeople	.868	.122
Competitive activity	-.015	.975
No of Service People	.806	-.275
No of Customers	.931	-.044

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Thus from the above factor analysis we were able to decide that there has been extraction of two factors that is driving the sales in kelloggs company.The scree plot also depicts that component 1 and 2 are two main driving factors that is influencing the sales in kellogs company, those includes sales potential - production department and sales dealers - service department are driving the sales

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