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INTRODUCTION:

According to specific professional fields and academic disciplines, research is generally known as systematic process which interrogation entails collection of data; documentation of critical information; analysis and interpretation of that data/information, in conformity with appropriate methodologies placed. The fundamental in conducting research is...

* Evaluate the validity of a hypothesis or an interpretive framework.
* To assemble a body of substantive knowledge and findings for sharing them in appropriately.
* To help generate questions for further inquiries.

In research determination thus concerned with the methodology that is carried out ie how data collection are done in the field (e.g. collection, experimentation, interview, participant observation, etc.) and the utilization of the data.  The opened validity of the hypotheses or research questions, and the quality of inferences that may result (unless, of course, the research methodologies severely compromise the data collection and data usage directly), is not something they will be evaluating.  
Research reviewed concerned with human subject’s involvement, and the word research should be reasoned under constrictive definition. Specifically, when the researcher is conducting research as outlined above and has [direct interaction with participants or data linked to personal identifiers](https://www.hampshire.edu/sites/default/files/shared_files/Personal_Identifiers.pdf).

In considering research variables for any scientific experiment or research process, involve factors that can be manipulated and measured respectively. Therefore whatever factor that accept different values consider as scientific variable that can influences the result of experimental research, such as the following variables such as gender, color and country are all absolutely acceptable variables, because they are inherently changeable. Almost all scientific experiments factors are measure and quantifiable by nature, such as time or weight, but this is not essential for a component to be classed variable.

**ASSIGNMENT 1: RESEARCH DEFINITION**

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The concept of research has been forwarded with several definition in different ways, and which have experience similarities, without individual ways it’s appear, but with all-inclusive definition that embraced by all with kin interest. Prominent among many is the [OECD](https://en.wikipedia.org/wiki/OECD) definition of research which state that, "Any creative systematic activity undertaken in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this knowledge to devise new applications." Followed is the definition of research is given by [John W. Creswell](https://en.wikipedia.org/wiki/John_W._Creswell), who states that "research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue". Three key elements are deduced from this definition which consists of, question position, response to answer question forwarded from data collection.

Research is about knowledge [creative](https://en.wikipedia.org/wiki/Creativity) and systematic work undertaken to escalation the store of knowledge”. It comprises the collection, organization and analysis of information that will accelerate understanding of a content. A research project recognize past activities that may requires further increase in the field work, by investigating the validity of instruments, procedures, or experiments, replicating elements of prior projects. The fundamental purposes of [basic research](https://en.wikipedia.org/wiki/Basic_research) (as conflicting to [applied research](https://en.wikipedia.org/wiki/Applied_research)) disused as follows; [documentation](https://en.wikipedia.org/wiki/Documentation), [discovery](https://en.wikipedia.org/wiki/Discovery_(observation)), [interpretation](https://en.wikipedia.org/wiki/Interpretation_(philosophy)), and  [research & development](https://en.wikipedia.org/wiki/Research_and_development) (R&D) which is an approaches and structures for human [knowledge](https://en.wikipedia.org/wiki/Knowledge) development. The research approaches depend on [epistemologies](https://en.wikipedia.org/wiki/Epistemology), which differ substantially both within and between humanities and sciences. In research development might takes many forms such: scientific, humanities, [artistic](https://en.wikipedia.org/wiki/Artistic), economic, [social](https://en.wikipedia.org/wiki/Social_research), business, [marketing](https://en.wikipedia.org/wiki/Marketing_research), [practitioner research](https://en.wikipedia.org/wiki/Practitioner_research), life, [technological](https://en.wikipedia.org/wiki/Technological)etc.

**ASSIGNMENT 2: SCOPE OF INVESTIGATION.**

Research is fundamental, hence many reasons are forwarded for its application. Its purposes constitute all the different styles, techniques, experiments and measurements.

**1. Exploratory Research:**

Exploratory research could be defined as the primary investigation into a hypothetical or theoretical idea. This is occurrence researcher has an opinion or has ascertained situation and seeks to comprehend more about it. An exploratory research endeavor to lay the project groundwork that will warrant l emerging studies, or a situation that influence for further explanation by a currently existing theory.

**2. Descriptive Research:**

By establishing the groundwork through explored activities, its eventual emerges to descriptive research, through provide adequate information to explore on the given agenda topic. Hence descriptive research comes in to play by trying to define occurrences in detail, by satisfying issues and intensifying our understanding. At this moment appropriate information are gather by avoiding guess or prediction for the future - the 'what' and 'how,' rather than the 'why.'

1. **Correlation Research:**

Correlational research is a form of nonexperimental research but rather a correlation studies to established measurement relationship between two variables in the researcher. Hence this research account without the control or manipulating the event of any, hence none significant effort to control the extraneous variables in assesses the statistical relationship.

**4. Explanatory Research**

At this point it’s established a link among exploring creativity with that of exploratory research, hence to accompanied descriptive research enhance understanding in analyzing. Explanatory research could be defined as away linking ideas to cognize cause and effect, meaning bringing ideas together through establishing greater understanding predict what will come next with some accuracy.

**ASSIGNMENT 3: AN OPERATIONAL DEFINITION**

Operational definition is fundamental to successful research in measuring the concepts and variables in application in addition to careful planning. Hence, it is refer to as operational definition because of it’s the specific nature in which a variable is measured. Operationally defining a variable in order to bring credibility to the methodology sound critical because another survey may consider the same variable differently to ensure the reliability of the outcomes of the results of the work, hence making it difficult to compare the results of these two studies.

The dictionary definition of operational is different from conceptual, descriptive, and consequently imprecise. In distinction, an operational definition present an noticeable, precise, and communicable meaning to a perception that provide specifically wide-ranging knowledge of the idea that are measured and applied within a given circumstances. The operational definition highlights two important things:

1. It contributes precisely to understand a ‘common language’ between two or more people either through spoken or written word.

2. It expresses how a term, word or phrase are applicable under specific situation with a different meanings.

Certainly because of the validity and reliability of an operational definition, the implication is given out what it is thought to measure. This implies that that the outcomes of the results should be the identical even when done by several people or done at different times by single person. It ensure a concise description of ideas and expressions for a given circumstance facilitate meaningful collection and standardized of data.

At the time data collection, it is relevant to define clearly every term to ensure that all data collected and analyzed are in the same agreement, to produce a precise and framed to avoid variation and confusion in interpretation.

## How to operationalize a variable?

## In real terms, the concept operationally defining of variable hasn’t got any established hard and first rule but variation may set in depending on the needs and the method desire to measure. Researcher mostly can logically select a meaningful explanation of a variable for determination, because there is any universally accepted definitions of all the variables .In many case, operational definitions exploited by many in their work of good standing result could be used for comparing purpose.

Once the research question are outline, will allow you to formulate broadly and includes all the variables you may want you to consider study, the hypothesis which is a statement that established specific relationship you may expect from your examination

In doing hypothesis it is wish to have numerous simple hypotheses than one complex one. However, it a good standing to limit the number of hypotheses in your study application. Studies with too large hypotheses than six will often time consuming and makes those participants who are interested and others uninterested participants either for discussion responses were not recognized.

**ASSIGNMENT 4: RESEARCH DESIGN**Research design could be experimental, descriptive, exploratory .However, the research design is the total plan will link the conceptual research challenges to achievable empirical research. The goal of the research design is to advance produce innovative knowledge or extend understanding of the activities involve. In other words, the research design articulates the application of data through its requirement and methods to introduce in data collection and analyses and how possible the responses might answer your research question. This process takes three main forms, hence the limitations between them may be unclear:

* [Exploratory research](https://en.wikipedia.org/wiki/Exploratory_research), which helps to identify and define a problem or question.
* [Constructive research](https://en.wikipedia.org/wiki/Constructive_research), which tests theories and proposes solutions to a problem
* [Empirical research](https://en.wikipedia.org/wiki/Empirical_research), which tests the feasibility of a solution using [empirical evidence](https://en.wikipedia.org/wiki/Empirical_evidence).

There are two major types research design: qualitative research and quantitative research represent empirical research. And these two methods qualitative or quantitative methods are selected by Researchers according to the nature of the research topic they want to investigate and the research questions they aim to answer:

[**Qualitative research**](https://en.wikipedia.org/wiki/Qualitative_research)

This concept involves understanding and reason behind human such behavior, that leads by asking a broad question, collecting data in the form of words, images, video etc, explicitly analyzed, and searching for themes. This nature of research aims to examine enquiries without trying to ascertain quantifiably variable measure to establish possible relationships. Because its time-consuming and relatively costly, It is viewed as more restrictive in testing hypotheses and with limitation to typically a single set of research subjects.

[**Quantitative research**](https://en.wikipedia.org/wiki/Quantitative_research)

This involves systematic empirical enquiry of quantitative properties, occurrences and relationships in developing a constricted question and collecting numerical data [statistical](https://en.wikipedia.org/wiki/Descriptive_statistical_technique) purpose. The quantitative research designs are experimental, correlational, and survey (or descriptive), that can be used to create associative or causal variable relationships.

**ASSIGNMENT 5: SELECTION OF THE SAMPLE AND DATA COLLECTION**

Sampling is a technique of understanding the characteristics (trends, analysis etc…) of a big population by selecting and studying a subset of that pollution. This small group of data is called a sample. A sample must represent the characteristics of that population, only then it should be used in six sigma or continuous improvement projects. If sample doesn’t represent characteristics of the population then probability of erroneous analysis and conclusions go up significantly.

Sampling is a scientific tool that is utilized to indicate how much data to collect and how often it should be collected. This tool defines the coordination of the samples in orderly manner to quantify a system. Its address two relevant questions, “how much?” and “how often?” are at the heart of sampling .i.e.

**Sampling is used any time data is to be gathered.**Data collection can only be ascertained unit it’s indicated the sample size (how much) and sample frequency (how often) have been determined.

**Sampling should be periodically reviewed.**  
Data collected requires periodic monitoring to ensure appropriateness in the process the frequency and size of the sample

Data can categorized into two types, quantitative and qualitative data. The quantitative data is numerical in nature and by every indication can be mathematically computed. While Quantitative data different scales uses to measure, which can be classified as nominal scale, ordinal scale, interval scale and ratio scale. Similarly, nominal scale categorize items into diverse group, for instance male and female, different examination grades, different races in a country, different types of companies , shoe sizes and so on, hence , mode is the statistics measure that is used to analyze the data.

There are several methods used to collect or obtain data for statistical analysis but the most three frequently used are the: Direct Observation, Experiments, and Surveys.

**questions are being asked of the data?**  
Before engaging in collecting any data, it very necessary to define clearly what kind of information is required, otherwise might be waste time and resources collecting either the wrong data, or not collecting enough information at the time of data collection. So first try to anticipate questions that will be asked when analyzing the data and any other additional information would be desirable. When collecting data, it is easy to record additional information; trying to track information down later is far more difficult, and may not be possible.

**2. Determine the frequency of sampling.**

The frequency of sampling refers to how often a sample should be assumed. A sample should be taken as frequently or at least expect a change in the process. Its requires Investigating wholly factors that might be warranty to cause change, and with identification of the most frequently change sampling in the process.. For example, if a process has exhibited a character and with indication of how often should sampling occur for a clear position of changes of personnel, equipment, or materials.

**3. Determine the Actual Frequency Times.**In considering this step the intention given is to state the potential time in attaining the samples. For instance, there is every reason-ability in determined the period of collecting the sample, either to be daily with time intervals in the morning at 8:00 am, around midday, or late in the day around 5:00 pm? The relevancy is to avoid unreliable timing in data assembly and analysis. Hence, the data and its possible outcomes will exhibit unusual patterns and will be less meaningful. Hence meaningful in time management on data gathering.

**4. Select the subgroup (sample) size.**A subgroup is a representation of numbers of samples that are examined at the same time. The terms “subgroup” and “sample” are interchangeably used through denotation of signs in cause of calculation to ascertain the most appropriate data being collected as either “variables data” or “attributes data.” From the subgroup.

**ASSIGNMENT 6: WHAT IS A THEORETICAL PERSPECTIVE?**

A single perspective is not considered the best in all circumstances. The application one of perspective may reasonably depend upon the question being asked at different level of exploring bureaucratic organization that may defers or concerned with social. On the contrary other, if one is attentive with social inequality, then most probably the conflict perspective is more useful.

Through theoretical perspectives it is easy to determine variety with families. Theoretical perspective is a “theory” means is not just an individual formulated idea but a structural framework, evaluated by researchers over a time through research development. Theories are critically relevant in many cases which helps to understand the world in broadly, and for this information help us with knowledge in understanding the ways in which families activities are performed globally. Moreover, from this concept will help us to define different key concepts including equity, social challenges and sociological imagination that are important to our understanding of equity and families in this course.

Normally theories vary in scope depending on the criterion of the subjects that requires explanation. Macro-level theories deals with large-scale matters and huge numbers of people, while micro-level theories view very specific relationships between small groups or individuals. In the case of **Grand theories** take cognizant to endeavor in enlightening large-scale relationships and response to essential questions such as why societies form and why they change. In the case of sociological theory should never considered complete and constantly evolving, whiles classic sociological theories are still considered essential and contemporary, but new sociological theories according to (Calhoun 2002) developed work done of their predecessors .

In sociology, a couple of theories provide broad perspectives that help our understanding of several aspects of social life, and these are called paradigms. **Paradigms** are philosophical and theoretical frameworks exploited within a self-control formulated theories, simplifications, and with experiments accomplished to support of them. Three fundamentals ideals of paradigms predominate in sociological thinking, due to their useful clarifications: structural functionalism, conflict theory, and symbolic interactionism.

A theoretical perspective for a discipline should be considered with broadly ideals rather than a few central ideas and naturally risks highlighting some topics and obscuring others. Burton-Jones et al. (2015) apply a different view of theoretical perspectives, treating them as approaches for performing research, e.g., variance, process, or systems perspectives in research design. In the recent times, there has been growing interest in theory building in Information Systems (IS) research. In examining theory building perspectives three perspectives – process, variance, and systems are considered in given out productive theoretical perspectives.

Perspective is define as a researcher’s choice of the kind of concepts and relationships applied to build a theory, and examine , contribute by informative and explaining these perspectives how they can be used more flexibly in future research. The understanding of perspective flexibility approaches indicates by showing how researchers can utilize theoretical perspectives in several ways to critique and extend an existing theoretical model (in our case, the IS Success Model). General, a shift has been suggested from the conventional process-variance dichotomy to a wilder view defined by conceptual latitude (the types of concepts and relationships available) and conceptual fit (the types of concepts and relationships appropriate for a given study). Hence, one can substantiate researcher quest for need shift enhancement in knowledge development.

**ASSIGNMENT 7: QUALITATIVE RESEARCH**

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The objective of Qualitative methods is to bring knowledge or Interpret, phenomena in terms of the meanings derived by individuals to qualitative research that may define initial interrogations that will be addressed in quantitative studies. Qualitative studies discourse and formulate questions on clinical challenges and are done using explicit for greater understanding.

Qualitative research cannot be given a single concise definition because of its broad in-depth nature of studies, and what it will try to achieve.  According to Keith Punch, defined Qualitative research as ''empirical research where data are not in the form of numbers''. Research refers to as empirical, means not a theory but that is based on data application with knowledgeable ideas. This data can take the form of videos, images, or artefacts.

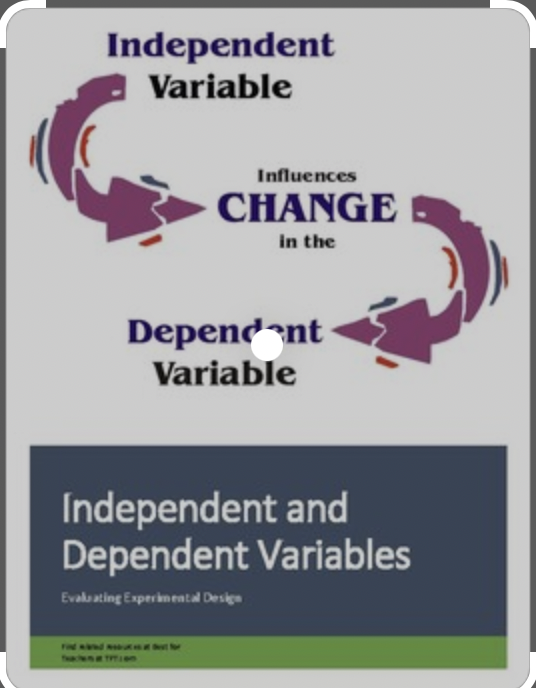
Base on the established fact here are various other definitions that will provide contrary perspectives. Qualitative researchers have growing interest in apprehension with what others have gathered have experienced globally. The study of qualitative research thus apply methods such as observation or narrative events, descriptive accounts, hence sociologist applying this methods typically discard positivism and adopt a form of interpretive. Qualitative research is a set of activity that identify observer, makes them visible and transform the world with its interpretive materials in the form of representations that includes field notes, interview, conversations, photographs, recording and memos to self. Hence qualitative research involves naturalistic approach to make sense or interpret phenomena that meaning to people understanding.

From my understanding unlike Randomized Clinical Trials (RCT) which provides evidence of study is meant to measure an intervention. For instance, qualitative research does examine experiences or people's perspectives in any instance but the study conducted does not influence getting the naturally happening or the natural scope of data within the environment or to make sense of phenomena. Qualitative research may take the form as either simple method of data collection, whiles others may be said to be complex but significant to the world.

Qualitative Research is said to beInductive means at the initial level it commence collecting data and then forward a patterns or drawing some kinds of theories from it. Whereas, in the case of quantitative research, at time it applies already established theories that is already tested i.e. the deductive approach, while as in the case of qualitative research relies on data collection to forms theories and patterns.

What I understand from this topic that qualitative researcher remains unknown, referencing far back to the 19th and 20th centuries that influence traditional anthropologists through observation research approach. Sigmund Freud's and Piaget, an established psychology relied on interviewing and observation technique in their works as case study. (Rene et al 2002) conduct a study on the incidence of how many the uses of qualitative research terms in research work papers in the field of psychology within the 20th century. Hence much was noted on its existence not until the 1980s, with a dramatic change in the 1990s with a sharp rise in its popularity and application.

**ASSIGNMENT 8: DESCRIBLE INDEPENDENT & DEPENDENT VARIABLES/DIFFERENCE.**

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A variable is either a concept or theoretical content which can be represented in measurable terms. It has a constituent that are refers to the qualities, characteristics, or attributes of a specific object, individual, or situation which is being studied.

For example, one consider age as a variable because it’s can take several values for different people or separate time duration for the same person.

Another example is the income of an employee is been considered as a variable, but however has the capacity to measure but similarly it’s something which we can easily manipulate and control. Variables are further divided into two types:

* Independent Variables
* Dependent Variables

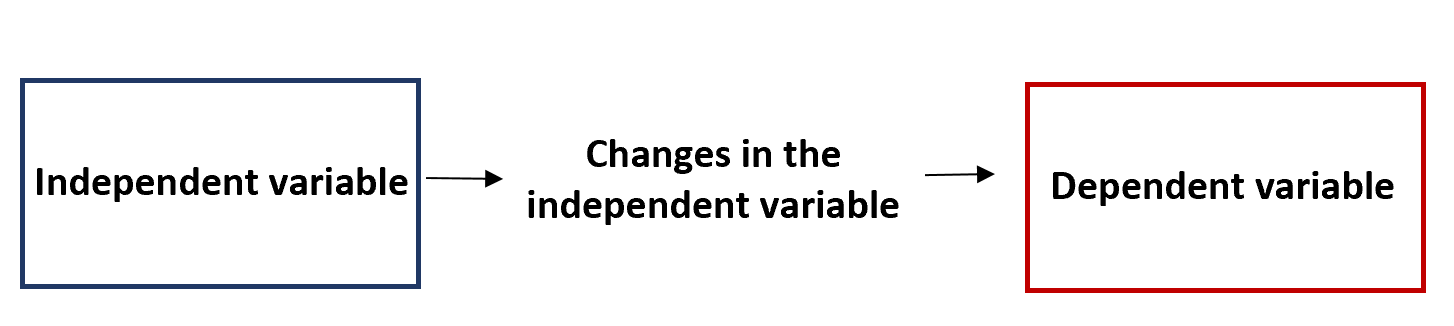
**What is Independent Variable?**

Independent variables are variables whose variations do not rely on another variable, whose variation depends on the researcher or one-on-one working with the variables which are subject to controlled inputs. It’s a determinant of the value of the dependent variable, hence a predictor variable, though normally used to test the rate of change of the dependent variable as it changes under a non-variable condition. Hence for instance, the duration of the motor car from one point to another varies, therefore agreed with independent action (speed) and time (dependent) reaction.

**What is Dependent Variable?**

Dependent variables are notably a variables whose changes count solely on another variable normally the independent variable. Its value of the dependent variable will only change on the action of if independent variable changes.

The movement determines the result changes by the function which characterizes the relationship between the dependent and independent variable. In mathematical sciences, independent variable is symbolized as a function of (e.g. y = f(x) = 3x+2, where y is the dependent variable, x is the function of independent variable f(x). Hence, since the function are predicted variable, the dependent variable measures the effect of the independent variable on the test unit(s).



## ****Example of an Independent and Dependent Variable****

For instance, the amount of water pour on the certain plant might be change by researcher to position him to observe whether it might affects the growth rate of the plant. Hence the quantity of water given to the plant is controlled by the researcher (**independent variable)**.and growth rate (**dependent variable).** .

## ****Key Differences between Dependent & Independent Variables:** **By Definitions**:**

A dependent variable is a secondary variable that by relies its existence on another variable usually the independent variable. On the other hand, an Independent variable existence is based on research experiments, its variations dos not rely on one another variable.

Both dependent and independent variable are in association of its variations but either depends on strong established difference in there mode of operation. Hence dependent variable depends on an independent variable, while an independent variable depends on external manipulation. For example, when assessing the speed limit of a car will also determine the time taken to reach its destination (dependent variable) depends on the speed (independent variable) which depends on the driver output on the car.

Also the established point from research experiment point of view is that dependent variables response to predictability and predicted by the behavior of independent variable. While the independent variables conceal with predictor ship and determine variation in dependent variable

* **Uses**

Under scientific research, the conclusion of the experiment is directly influence by the dependent variable through information delivered, while the independent variable is applicable in value determination of the dependent variable, whiles the independent variable only indirectly influences the conclusion of the experiment.

For example, in the cause of investigating increased in student failure rate, number of hours spent by student reading per day is consider. The independent variable is the number of hours exhausted by student reading and the grade is the dependent variable of the student and therefore the grade determine the outcome.

* **Advantages**

According to researchers dependent variables cannot be manipulated either by the any other external factor or researcher, hence not bias to any forms of outcome, it is free from neither people to the researcher's bias nor the respondents' bias.

For Independent variables are easy available with less complex mathematical procedures and observations like dependent variables. Base on its data collection techniques it has the tendency to be easily manipulated by the researcher or data collected from respondents .In some cases, the independent variables due to their natural factors are cannot be manipulated by the researcher, though are also easily obtainable with less time to obtain independent variables.

* **Disadvantages**

Dependent variables are normally time spent processes and costly, hence are obtained from longitudinal study and helpful solving complex mathematical equations.

In many case, Independent variables are inclined to researcher and respondents' partiality, therefore affecting the results of the study. The only solution might be completely avoidable if the independent variables are naturally occurring and are not manipulated by the investigator. For example, when investigating the effect of sunlight on pigmentation, researchers control the exposure of sunlight on each sample of the experiment.

**ASSIGNMENT 9: DATA ANALYSIS IN QUALITATIVE RESEARCH **

Qualitative Data Analysis (QDA) discus wide range of processes and procedures applicable on the qualitative data in which data have been collected to transform them into some form of human explanation, understanding or interpretation and for a given situations being investigated.

QDA is philosophy that is usually based on an interpretation. The intent behind qualitative analysis is to answer to ‘why’, ‘what’ and ‘how’ questions, and to analyze the meaningful and symbolic content of qualitative data.

In many cases people have got several experience with quantitative data and must have used various [mathematical tools and methods](https://www.udemy.com/excel-for-the-college-graduate/?tc=blog.qualitativedataanalysis)to [perform data analysis on the numbers and data](https://www.udemy.com/course/data-analysis-with-r/?tc=blog.qualitativedataanalysis). But with the concept called qualitative data, its data application consists of words, texts, observations, and not numbers. These data mostly involve with individual and their activities such as, signs, symbols, and what peoples have said and done.

As in the case of several other data, qualitative data similarly can be better understand through by analyzing and interpretation of information, its goes without no variables and hypotheses and hence there is no one way to provision for analyzing textual data. Also qualitative analysis does have any fixed formula but can help to transforms data into finding with few laid down guidance and directions but the final destination and interpretation varies with the inquirer.

Below are some common examples of qualitative data that are explanation and information gathered from these documents?

* Interview description
* Field notes on discovery by researchers
* Transcript of video and audio recordings
* Interpretation of images
* Documents which may consist of reports, minutes of meeting, e-mails, and so on

Qualitative data analysis concerns about a process of assembly, structuring and interpreting qualitative data for the purpose of understanding and representation. Hence it’s non-numerical and unstructured data, which normally refers to as text, denoted as open-ended answers to survey questions or user interviews, but also includes audio, photos and video.

Most businesses often carry out qualitative data analysis on customer feedback. And within this circumstance, qualitative data is mostly refers to verbatim text data from sources such as reviews, complaints, chat messages, support center interactions, customer interviews, case notes or social media comments.

To clearly understanding these processes is a relevant aspect not only of offering qualitative research, but by extension your reading, understanding, and interpreting it. For readers of qualitative studies found the language of analysis can be unclear. It might be sometimes challenging in understanding what actually the researchers doing during this phase and findings as outcome from data collected.

For instance, neophyte nurse researchers, reveal that several of qualitative strategies in data collection involved comfortability. Above all, unarguably nurses clinical practice are normally based on learning as much as possible about provide individualized care.

Unquestionably, data analysis is seem to be a complex phases in qualitative project with less attention on its literature. Though database creation is less relevant in conducting a qualitative study but its findings may transform raw data into new knowledge, a qualitative which those create demanding in the research work.

**ASSIGNMENT 10: WHAT IS RANDOM VARIABLE?**

A random variable is a scientific type of variable whose realizable values depend on the outcomes of a certain random phenomenon. Random variable all by its self can assume different values, it normally represented with a letter (e.g., variable “X”). Each variable possesses a specific probability distribution function (a mathematical function that represents the probabilities of occurrence of all possible outcomes).

### Types of Random Variables

Random variables are categorized into discrete and continuous variables, with a primary difference of possible values that each a probability distribution function.

### 1. Discrete

A discrete random variable by makeup with values that accept only a finite number of values. The best illustration of a discrete variable represent throwing the dice purely random event. At the same time, the dice can take only a finite number of outcomes {1, 2, 3, 4, 5, and 6}.

The possible outcome of each discrete random variable thus contains a certain probability. For example, the probability of each dice outcome is 1/6 with the equal probabilities .Note that the total probability outcome of a discrete variable is equal to 1.

#### 2. Continuous

For Continuous random variables, unlike discrete variables, its only accommodate an infinite number of possible values. Typical examples of a continuous variable is the [returns of stocks](https://corporatefinanceinstitute.com/resources/knowledge/finance/rate-of-return-guide/). The returns can take an infinite number of possible values (as percentages). Hence, the probability of a certain outcome for the continuous random variable is zero. However, there is always a non-negative probability that a certain outcome will lie within the interval between two values.

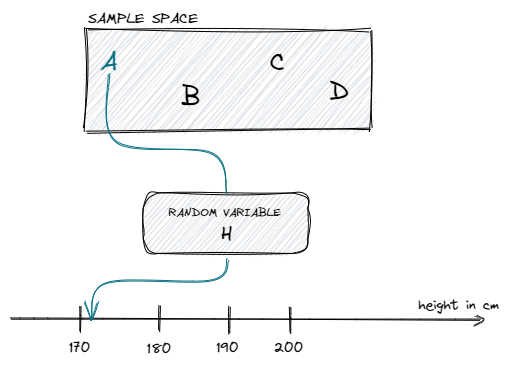
Understanding the probability distribution, allows us to compute the probability of a certain outcome by also accounting for the variability in the results. This help to reason out from the sample to the population, estimate the data-generating function and for possible accurate predicted behavior of a random variable.

Broadly speaking, around random variable as variable with value depends on the result of a random event. It can be identify as a function that maps from the sample space to a measurable space (e.g. a real number).

Assuming, with 4 students with a sample space containing {A, B, C, D}. If student A we now randomly picked and height is measure in centimeters, If we think H AS the random variable of the function with input of student and the output of height as a real number.

IMG_256

We can visualize this small example like the following:



An Example of a random variable [Image by Author]

Hence selecting student randomly depending on the outcome in which the random variable (H) can take on different states or different values in terms of height in centimeters. A random variable can be either discrete or continuous. For a random variable to be discrete can take only a finite or countably infinite number of well-defined values. Examples of a discrete random variable include the number of students in a class, test questions answered correctly, the number of children in a family, etc.

For random variable to be continuous provided if between any two values of the variable are an infinite number of other valid values. For instance, quantities such as pressure, height, mass, and distance are all continuous random variables. If we match random variable with that of probability distribution several question will be answer between random variable and basically the same as asking for the probability.

**THE LIMIT STATE FUNCTION**

A reliability of a system is modeled refers to as its limit state function with a representation of the letter g. The result of limit state function returns a negative value under the condition of system failure and the system is stable with a positive value. Implicitly, this illustrate the difference between resistance, R, and load, S: The limit state function does distinct the safe region from that of the failure region as depicted in the graph below.

**FAILURE PROBABILITY**

As antecedently mentioned, both resistance and load of a system count on random variables. Therefore, each have a probability distribution (fS(S) and fR(R)), when combine together produce a joint probability density function, fRS (R,S): If known the joint probability density function hence, one can calculate directly the probability of failure (i.e. falling in the failure region).

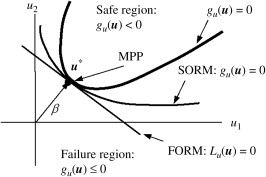
## Usually, in representation of the limit state function is denoted by g (Z), where Z is a trajectory of all uncertainty variables. g (Z) ≤ 0 occurs when there is Failure. For a given LSF with g (Z), the probability of failure is defined Pf.

The result of failure probability can also be expressed in terms of a reliability (safety) index, β, which is uniquely related to the failure probability by where Φ (·) is a [standard normal distribution](https://www.sciencedirect.com/topics/engineering/standard-normal-distribution) function. Generally speaking two approaches analytic and simulation methods are available to solve equation respectively.

## [Reliability Analysis](https://www.sciencedirect.com/science/article/pii/B9780123820389000107).

For a function of limit state of high curvature at the MPP, the approximation of first-order may not provide satisfactory accuracy in failure of the probability calculation. The probability integration for a given equation reason out the application FORM, thus  ignores the [probability density function](https://www.sciencedirect.com/topics/engineering/probability-density-function) for the volume underneath the surface and the area between the true limit state function gu(u)= 0 and the linearized function Lu(u) = 0, as illustrated in Figure below.

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***Figure: Comparison of FORM and SORM using a two-dimensional example*.**

For limit state functions that with a large curvature at the MPP, the reliability method of the second-order offers a more accurate approximation of failure of probability. Having a discussing the mathematics of [SORM](https://www.sciencedirect.com/topics/engineering/order-reliability-method), with its application by concisely review to understand few critical equations and how the method works. the second-order [Taylor series SORM applies by expansion](https://www.sciencedirect.com/topics/engineering/taylor-series-expansion) to approximate the limit state function at the MPP u∗.The [Hessian matrix](https://www.sciencedirect.com/topics/engineering/hessian-matrix) of n × n at the MPP, estimate where H(u∗), *where*n*represent number of*[*random variables*](https://www.sciencedirect.com/topics/engineering/random-variable-xi)*.*

As illustrated above about a more accurate failure probability estimate, especially for a function of large curvature at the MPP, is provided by integration using the boundary curve qu(u) = 0, which is a better approximation than the straight line Lu(u) = 0 used in FORM for the true limit state function gu(u) =0.

According to. (Wei, 2006) despite the limit state function is with basic [quadratic function](https://www.sciencedirect.com/topics/engineering/quadratic-function) qu (u), equation but the equation calculation stills remains demanding, derived with a given approximation (e.g). When β is large enough, an [asymptotic solution](https://www.sciencedirect.com/topics/engineering/asymptotic-solution) of a probability of failure derived as where ki is the ith main curvature of the limit state function gu(u) at the MPP

## Linearization Nonlinear Models

Linearization in a minor region around an operating point of a linear approximation of a valid nonlinear system for instance, assuming that the nonlinear function is *y*=*x*2. Linearizing this nonlinear function about the operating point x= 1, y= 1 outcomes in a linear function *y*=2*x* 1.

At a distant from the operating point, the approximation is deprived but for a close range to the operating point, *y*=2*x* 1is a good approximation to *y*=*x*2. This result indicated good possible region which gives approximation for the linearization of *y*=*x*2.hence the actual region of validity contingent on the nonlinear model

The conduct of a nonlinear system, described by y=f(x), in the vicinity of a given operating point, 0x=x0, can be approximated by plotting a tangent line to the graph of f(x) at that point.

Analytically, linearization of a nonlinear function involves first-order Taylor series expansion about the operative point. Let represent the variation from the operating point; then the Taylor series of a function of single variable is written as:

There is the need to broaden dynamic system through conceptualization of linearization equation, by writing continuous-time nonlinear differential equations in this form:

*x*(*t*)=*f*(*x*(*t*),*u*(*t*),*t*)*y*(*t*)=*g*(*x*(*t*),*u*(*t*),*t*).

In these equations, x (t) denotes the system states (t) represents the inputs to the system, and y (t) stand for the outputs of the system.

A linearized model of this system is valid in a small region around the operating point t=t0, x (t0) =x0, u (t0)=u0, and y(t0)=g(x0,u0,t0)=y0.

**Conclusion:**

Research fundamentally signifies as the process of gathering information and then exploitation of that information to make conclusions. Once information is trustworthy and accurate its will result to credible objective and certain in its conclusions, hence the research considered. Basically, data is plainly information that is drives from several different sources that can be presented itself in numerous forms which is been used by researchers to response to questions – this information can come.

Researcher is the information through an analytical technique or design approach to draw conclusions. Research can classify as either quantitative or qualitative by the source or form of data that it uses and the research design/analytical approach, though often, the distinction is not entirely obvious.

Giving a definition of data as qualitative thus is fairly straight-forward. Fundamentally by every indications qualitative data as got any forms of numerical nature, though frequently applicable in research. Mostly takes the forms of words but similarly the used of other functions such as images, sounds, interview, video-taped and also consider personal conversation and other potential source of information.

For quantitative research classified information deals with surveys and administrative data analysis. Its sound simple and direct to make a distinction but is admittedly a little vague and simplistic. Finding a precise definition, it’s be becomes elusive response because quantitative studies agreed to open-endedness in carrying out survey questions and other acceptable forms not limited to, semi structured interviews. The study set out assumptions, principles, and even values about truth and reality, that clearly distinguishes the data in a quantitative study from those generated in a qualitative designed.

Quantitative researchers established the objective with scientific method to ascertain the truths that exist in the world and find ways to develop clear understanding of certainty. In actual practice, several studies has revealed that quantitative studies concern with inductive reasoning, whereas qualitative investigation subscribe to full range of strategies.

**Bibliography**

<https://en.wikipedia.org/wiki/Research>

<https://courses.aiu.edu/RESEARCH%20%20METHODOLOGY/session%202/2.pdf>

<https://www.iedunote.com/operational-definition>

<https://courses.lumenlearning.com/sociology/chapter/theoretical-perspectives/>

<http://www.palgrave-journals.com/ejis/journal/vaop/ncurrent/abs/ejis201431a.html>

<https://www.physio-pedia.com/Qualitative_Research>

<https://ebn.bmj.com/content/ebnurs/3/3/68.full.pdf>

<https://getthematic.com/insights/qualitative-data-analysis/>

[hthttps://www.pqsystems.com/qualityadvisor/DataCollectionTools/sampling.phptps://blog.udemy.com/qualitative-data-analysis/](https://blog.udemy.com/qualitative-data-analysis/)<https://www.researchgate.net/publication/12571206_Methods_of_sampling_and_data_collection><https://www.statology.org/independent-vs-dependent-variables/><https://www.formpl.us/blog/dependent-independent-variables>