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4. Research Design Perspective and Methodological Approaches

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4.1 Introduction:

The research technique is the path that researchers must take in order to do their research. It demonstrates how these researchers construct their problem and objectives and deliver their findings based on the data collected during the study period. This research design and methodology paper also demonstrates how the research outcome will be reached in accordance with the study's objectives. As a result, this paper outlines the research methods used during the study process. It encompasses the study's research technique, from research plan to result distribution. For emphasis, in this paper, the author outlines the research strategy, research design, research methodology, the study area, data sources such as primary data sources and secondary data, population consideration and sample size determination such as questionnaires sample size determination and workplace site exposure measurement sample determination, data collection methods like primary data collection methods including workplace site observation data collection and data collection through desk review, data collection through questionnaires, data obtained from experts opinion, workplace site exposure measurement, data collection tools pretest, secondary data collection methods, methods of data analysis used such as quantitative data analysis and qualitative data analysis, data analysis software, the reliability and validity analysis of the quantitative data, reliability of data, reliability analysis, validity, data quality management, inclusion criteria, ethical consideration and dissemination of result and its utilization methodologies. In order to meet the study's aims, both qualitative and quantitative research methods are recommended. Because data were acquired from all parts of the data source during the study period, the study employed these mixed techniques. As a result, the goal of this methodology is to satisfy the researcher's research objective and target.

The research design is meant to give a suitable structure for a study.

The decision to be made about research approach is a very important decision in the research design process since it affects how relevant information for a study will be gathered; nevertheless, the research design process contains several interrelated decisions. This study used a combination of methodologies. The first stage of the research included a series of well-structured questionnaires (for management, employee representatives, and industry technicians) and semi-structured interviews with important stakeholders (government bodies, ministries, and industries) at participating organisations. The other design employed was an employee interview to determine how they feel about workplace safety and health, as well as field observation at the selected industrial sites. [1]

As a result, this study adopts a descriptive research approach to reach an agreement on the effects of occupational safety and health management systems on employee health, safety, and property damage in certain industrial industries. As a result of this research approach, the researchers were able to collect data from a diverse spectrum of respondents on the impact of safety and health on Ethiopian manufacturing industries. And this aided in analysing the responses gathered on how it affects workplace safety and health in the manufacturing industries. Figure 1 depicts the overall design and flow procedure of the research. [2]

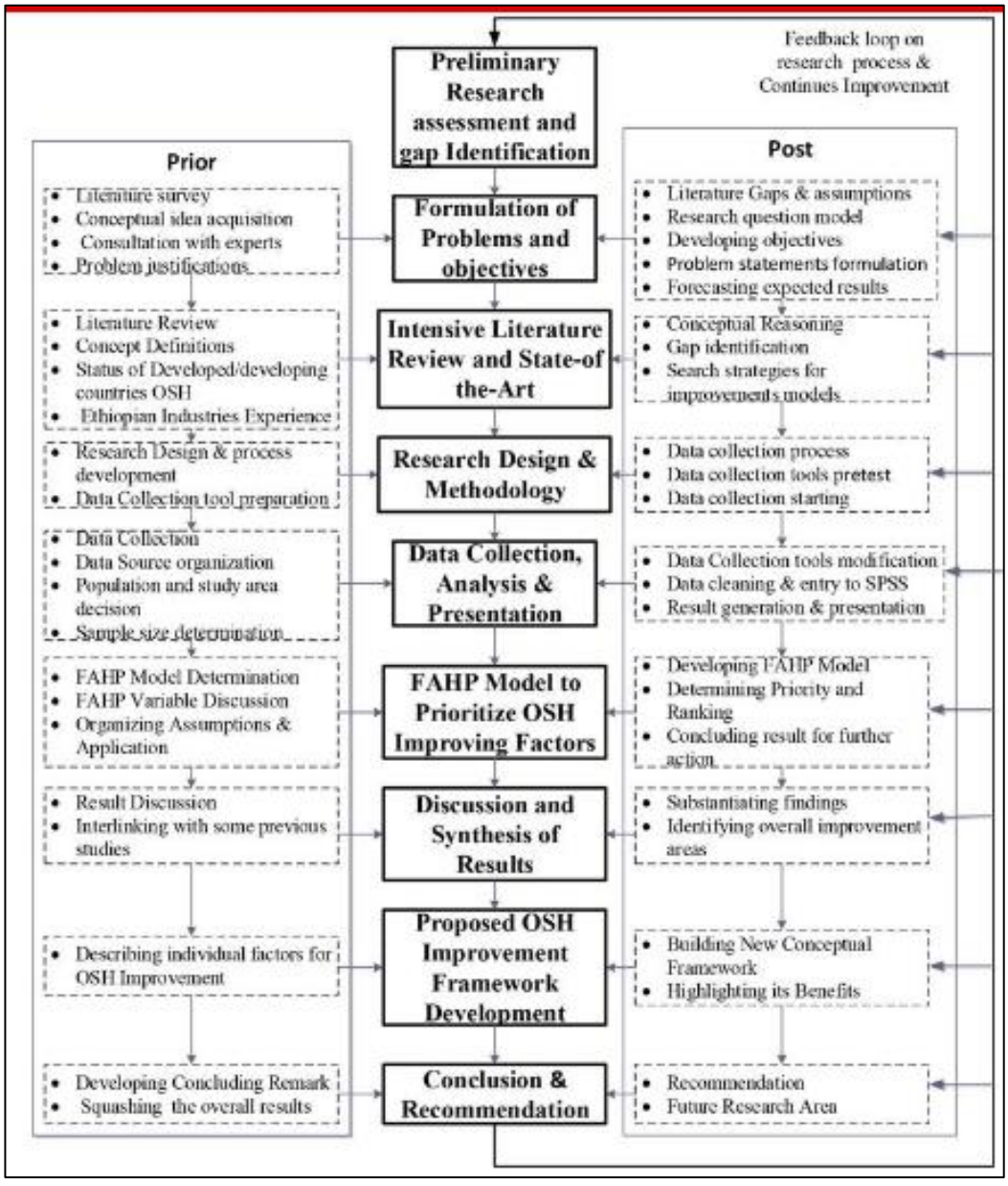

Figure 4.1: Research methods and processes

When conducting research, a particular pattern or plan of action is followed throughout the method, i.e., from problem identification to report preparation and presentation. The term "research design" refers to this specific pattern or plan of activity. It is a road map that directs the researcher's data collection and analysis. In other words, research design serves as a guideline that must be followed throughout the study process. A building, for example, cannot be built unless its structure is known. A builder cannot order raw materials or set deadlines until he understands the construction of the project, which could be an office building, a school, or a home.

4.2 Features of A Good Research Design:

It is considered that a good research design should reduce the biasness while should maximize the reliability of data being collected and analysed. A good research design should provide the opportunity as per the various aspects of research problem. It should minimize the experimental error and should provide maximum information. Hence, it can be concluded the selection of research design relies upon the research problem and the nature of research. Following are the major features of a good research design:

A. **Objectivity:** The ability of research tools to produce conclusions free of observer bias is referred to as objectivity. A good research design should be able to pick only those instruments that produce objective results. It is commonly assumed that keeping objectivity is simple, however it becomes difficult throughout research and data processing.
B. **Reliability:** The dependability of responses is another important aspect of a good study design. The research tools should be able to produce equivalent responses to a question posed by a responder. If the response changes, the instrument is deemed untrustworthy. In other words, the consistency of replies is used to assess the trustworthiness of a research design.
C. **Validity:** The ability of a competent study design to answer the questions in the manner planned is an important attribute. It should concentrate on the research's goal and develop particular arrangements or plans to achieve that goal. For example, if a study is undertaken to assess the effects of commercials on viewers, it should be able to answer this question rather than the sale of a certain product.
D. **Generalizability:** A research strategy is said to be generalisable if the findings are applicable to a larger population from which the sample was drawn. A research design can be made generalizable by properly defining the population, carefully selecting the sample, analysing the statistical data, and methodologically preparing it. As a result, the more generalizable the conclusions, the more efficient the research strategy.
E. **Sufficient Information:** Any research is carried out in order to get insight into the hidden facts, data, and information. The study design should be able to supply the researcher with enough information to allow him to examine the research problem from a broad perspective. The research design should be capable of identifying the research problem and objective.
F. **Other Features:** Along with the aforementioned, there are also more characteristics that contribute to a strong research design. These include adaptation, flexibility, efficiency, and so forth. A good study design should be able to minimise errors while increasing precision. [3]

4.3 Research Design Types:

A researcher must clearly understand the various types to select which model to implement for a study. Like research itself, the design of your analysis can be broadly classified into quantitative and qualitative.

A. Qualitative Research:

It uses mathematical computations to determine links between acquired data and observations. Statistical approaches can be used to prove or invalidate beliefs about natural phenomena. Researchers use qualitative observation research methodologies to determine "why" a specific theory exists and "what" respondents think about it.

B. Quantitative Research:

It is used in situations where statistical conclusions are required to collect actionable insights. Numbers provide a more objective viewpoint for making key business decisions. Quantitative research methodologies are required for any organization's progress. When making future business decisions, insights obtained from complex numerical data and analysis show to be quite beneficial.

4.4 Qualitative Research Vs Quantitative Research:

Table 4.1: The following chart illustrates the key differences between qualitative and quantitative research:

Qualitative Research	Quantitative Research
Focus on explaining and understanding experiences and perspectives.	Focus on quantifying and measuring phenomena.
Use of non-numerical data, such as words, images, and observations.	Use of numerical data, such as statistics and surveys.
Usually uses small sample sizes.	Usually uses larger sample sizes.
Typically emphasizes in-depth exploration and interpretation.	Typically emphasizes precision and objectivity.
Data analysis involves interpretation and narrative analysis.	Data analysis involves statistical analysis and hypothesis testing.
Results are presented descriptively.	Results are presented numerically and statistically.

To summarize, qualitative research is more exploratory and focuses on understanding individuals' subjective experiences, whereas quantitative research focuses on objective data and statistical analysis. [4]

4.5 Research Approach:

study approaches are study plans and procedures that cover everything from general assumptions to detailed methods of data collecting, analysis, and interpretation. This plan necessitates multiple decisions, which do not have to be made in the order in which they make sense to me and are presented below. The ultimate decision entails deciding how to study a subject. This decision should be informed by the researcher's philosophical assumptions, procedures of inquiry (called research designs), and specific research methodologies of data collecting, analysis, and interpretation. The nature of the research topic or issue being addressed, the researchers' personal experiences, and the study's audiences all influence the choice of a research approach. Thus, in this book, research approaches, research designs, and research methods are three essential terms that define a perspective on research that offers information in a sequential manner from large research structures to narrow methodological procedures.

4.5.1 The Three Approaches to Research:

Three research approaches are advanced:

A. qualitative,
B. quantitative, and
C. mixed methods.

Without a doubt, the three techniques are not as distinct as they appear. Qualitative and quantitative techniques should not be regarded as inflexible categories, polar opposites, or dichotomies.

A study is more likely to be qualitative than quantitative, or vice versa. Because it contains components of both qualitative and quantitative methodologies, mixed methods research falls somewhere in the middle of this spectrum.

The contrast between qualitative and quantitative research is sometimes defined by the use of words (qualitative) rather than figures (quantitative), or the use of closed-ended questions (quantitative hypotheses) rather than open-ended questions (qualitative interview questions).

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Interest in qualitative research grew in the later part of the twentieth century, as did the development of mixed methodologies research. With this context in mind, the following definitions of three major concepts used in this book might be useful:

- Qualitative research is a method for investigating and comprehending the meaning that individuals or groups attach to a social or human situation. The research process includes developing questions and procedures, data collection in the participant's environment, data analysis inductively building from particulars to general themes, and the researcher providing interpretations of the data's meaning. The structure of the final written report is adaptable. Those who engage in this type of inquiry advocate for a research approach that values an inductive manner, an emphasis on individual meaning, and the necessity of conveying a situation's complexity.
- Quantitative research is a method of testing objective hypotheses by examining the relationship between variables. These factors can then be measured, often with devices, and the resulting numbered data can be analysed statistically. The final written report follows a predetermined framework that includes an introduction, literature and theory, methods, results, and commentary. Those who conduct this type of research, like qualitative researchers, have beliefs about testing hypotheses deductively, incorporating bias safeguards, controlling for alternative explanations, and being able to generalise and replicate the findings.
- Using a combination of approaches Research is a method of investigation that involves gathering both quantitative and qualitative data, combining the two types of data, and employing diverse designs that may include philosophical assumptions and theoretical frameworks. The primary premise of this type of investigation is that combining qualitative and quantitative methodologies yields a more thorough grasp of a study subject than either strategy alone. [5]

4.6 Theoretical and Epistemological Perspective:

Although management research is primarily concerned with observing persons and their conduct, the epistemological framework is influenced by science. Positivism asserts the independent existence of observable facts in the social environment, and researchers who hold this viewpoint will seek a fairly precise measurement technique. Interpretivism, on the other hand, considers that humans interpret events, therefore researchers who use this method will take a more subjective approach.

4.7 Quantitative Approaches to Research Design:

The objective nature of quantitative research distinguishes it. The premise is that facts exist completely independently of one another, and that the researcher is a completely objective observer of occurrences with no power to affect them. As such, it is likely to begin from a positivist or empiricist viewpoint.

The research design is based on a single iteration of data collection: the categories are isolated prior to the investigation, and the design is planned out and not generally changed during the study (as it may be in qualitative research).

A. Qualitative Approaches to Research Design:

Qualitative research acts from a different epistemological standpoint than quantitative research, which is primarily objective. It is a viewpoint that recognises the fundamental difference between the social and scientific worlds, realising that humans do not necessarily follow natural laws, but rather consist of a wide range of sentiments, observations, and attitudes that are ultimately subjective in origin.

As a result, the theoretical framework is likely to be interpretivist or realist. Indeed, in qualitative studies, the researcher and the research instrument are frequently merged, with the former serving as the interviewer or observer, whereas in quantitative studies, the research instrument may be a survey and the participants may never see the researcher.

"We hold that the social construction of reality is personal, experienced by individuals and between individuals - in fact, the interactions that connect us are the building blocks of reality, and there is a great deal of meaning in the space between individuals."

Unlike quantitative research, which relies on statistics, qualitative research data is based on observation and words, and analysis is based on interpretation and pattern detection rather than statistical analysis.

The following are common qualitative research criteria:

- Intense and sustained field interaction aimed at obtaining a holistic or systemic view.
- Perception is gained from within depending on actors' comprehension.
- There is little usage of standardised instrumentation.
- The majority of analysis is done with words.
- The data can be interpreted in a variety of ways. [6]

4.8 Methodology:

You may only have 'one shot' at collecting data at times; in other words, you plan your sample, your technique of data collection, and then examine the results. This is more likely if your research methodology is more quantitative.

Other sorts of research approaches, on the other hand, require stages in data collection. In grounded theory research, for example, data is collected and processed, and the process is repeated when additional information about the subject is uncovered.

Similarly, there is a cyclical process of data collecting, reflection, and additional data collection and analysis in action research. [7]

4.9 Conclusion:

The general procedure of the flow of the research for the provided study was specified by the research technique and design. The data sources and methods of data collection were used. The whole research strategies and framework are provided in this research process, which includes all parameters from problem conceptualization through problem validation. It has provided some context for how research methodology is developed and framed for researchers. This indicates that it can be used by researchers as one of the samples and models for the study data collecting and procedure from the beginning of the problem description to the research finding. This research cycle, in particular, introduces new researchers to the research environment and methods.

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