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Topic: Develop advanced quality control methods, including non-destructive testing techniques, to ensure consistent quality and performance of clay pipes throughout the manufacturing process

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Chapter 1: Introduction

1.1: Planning about dissertation

Consistent excellent performance of clay pipes throughout the production process may be achieved by utilising modern quality control methods that incorporate non-destructive testing techniques. This is the goal of the dissertation. Thus, it can be said that the drainage, sewage, and plumbing sectors, among others, rely heavily on clay pipes. Material discrepancies, production differences, and environmental pressures are some of the reasons that might make maintaining their high level of performance problematic. Our study seeks to tackle these problems as well as offer an extensive remedy for maintaining consistently high standards in clay pipe production. This can be done through the use of modern quality control technologies as well as non-destructive testing.

1.2: Aiming to find

There are a few significant stages in the exposition plan. To acquire a total image of the current situation with the-art methodology and conceivable improvement regions, we will initially do writing research on clay pipe creation, quality control systems, and non-destructive testing procedures. In this way, it very well may be thought that the subsequent stage is to look at the viability of various non-destructive strategies for assessing the primary uprightness and shortcoming identification of clay pipes. A few instances of this strategy are visual assessment, radiographic testing, and ultrasonic testing.

1.3: Planning to achieve the aim

Using the shortcomings and difficulties of the current quality control procedures as a starting point, the study goals will be created. Along these lines, one might say serious areas of strength for control norms ought to be laid out to ensure steady item execution and enhance fabricating cycles to limit inconstancy as well as mistakes. It likewise incorporates making special non-destructive testing procedures redid for clay pipes, which are possible points. The review will likewise take a gander at ways of further developing quality control strategies by integrating state-of-the-art innovation like simulated intelligence as well as machine learning calculations.

1.4: Idea is worth

Given the topic's practical ramifications as well as possible influence on sectors dependent on clay pipes, it is very valuable. So, it can be said that problems with expensive repairs, structural collapses, and environmental dangers might result from clay pipes' inconsistent performance along with quality. Thus, it can be opined that improved product dependability, less waste and rework, and overall efficiency may be achieved by manufacturers through the development of improved quality control systems as well as non-destructive testing techniques.

1.5: Aims:

The main aim of this research is to evaluate the procedure and also the non-destructive techniques of the manufacturing process of clay pipe, which helps to maintain the quality of the pipe.

1.6: Objectives

The main objectives of this research are as follows-

- To estimate the importance of the manufacturing process of the clay pipe
- To evaluate the significance of the advanced quality control system of the manufacture of the clay pipe.
- To investigate the role of the non-destructive methods in ensuring the maintenance of the quality and also the performance of the clay pipe.
- To develop the potential strategy for the manufacturing process of the clay pipe.
- To make some alternative way to manufacture this pipe for wider uses.

1.7: Rational

There are so many important of the production and also the uses of the clay pipe, and this clay pipe was used in the ancient periods. But the uses of this pipe have also increased in

recent times, and thus, the manufacturing process of the clay pipe is also essential. The people who are involved in the manufacturing process of the clay pipe need to be aware of some new technology which will help to promote the quality of the pipe and maintain the proper work in the different sectors. One of the main things required for the manufacture of pipes is joints, and thus, the people who join the pipe should be responsible and aware of the different methods that help to maintain the quality of the pipe. Structural design and the efficiency and durability of the clay pipe need to be maintained, and thus, it is required to promote the proper techniques for manufacturing the pipes (Su et al., 2020). This study will help promote the idea of the non-destructive procedure of pipe manufacturing and also promote some strategies that will help maintain the manufacturing process. This research will help reduce the issues of making the pipes, and thus, future researchers and manufacturers will get the advanced techniques of manufacturing clay pipes.

Chapter 2: Literature Review

2.1: Importance of the clay pipe

As per the view of Rabelo et al. (2022), the uses of clay pipe have been used since the ancient periods, and thus, the engineers of the recent era have also used this pipe for many purposes; thus, the utilisation of the pipe in the different sectors is also improved. There are many advantages of this clay pipe compared to the other pipes, and thus, the engineers are using some techniques that help to maintain the performance of the clay pipe. The advantages of this clay pipe are to restrict chemical corrosion, and thus, the toxic chemicals are also resistant to entering through the clay pipe, and thus, the quality of the water through the pipe is also improved. This pipe has a longer service life as compared to the other PVC pipes, and thus, the uses of this pipe are increased in the different sectors and develop the quality of the transport of water through the pipe. This pipe is also eco-friendly, and thus, the uses of this pipe help to maintain sustainability and promote the development of the environment. This pipe is also less affected by the different factors of the environment, and thus, it has a longer service life.

2.2: Importance of the advanced quality control system of the manufacture the clay pipe

According to Bag et al. (2021), it is necessary to maintain the proper quality control of the manufacture of clay pipe as it helps to increase the advantages of the clay pipe and is used for different work. There is much importance in quality control in the manufacture of clay pipes. The benefits are – that many people are not considered to implement clay pipe at different work at home. The advanced quality control system of the pipe helps to improve the performance, and thus, it meets the satisfaction of the customers. Therefore, many people want to use this pipe for different purposes at home and also for commercial uses. There are some specific industrial regulations, and thus, it is mandatory to promote the proper standard of the pipe, which leads to maintaining the regulation. The advanced quality system helps to maintain the QC process of the pipe, and thus, it helps to maintain the proper development(Wang and Chen, 2020).

2.3: Role of the non-destructive methods in ensuring the maintenance of the quality and also the performance of the clay pipe

As stated by Nturambirwe and Opara (2020), the non-destructive methods have the advantage of promoting the proper quality of the pipe, and thus, they help encourage the adequate performance of the clay pipe. There are some advantages of the non-destructive methods, and thus, they help promote the proper improvement of the quality of the pipe. The non-destructive testing helps to make safe products, and thus, it helps to maintain the proper safety pipe, which is used for different purposes. The non-destructive methods also help to promote the cost efficiency methods, and thus, it helps to encourage the proper costing of the implementation of the clay pipe. The amount of waste is also reduced in the case of the non-destructive methods of manufacturing the clay pipe, and thus, it also helps to maintain sustainability.

2.4: Potential strategy of the manufacturing process of the clay pipe

According to Bratu et al. (2021), there are some strategies that need to be implemented, and thus, it help promote the quality of the clay pipe and maintains the proper installation of the

pipe for different purposes. The strategy that needs to be taken for the development of the quality of the pipe is – to establish a clear standard and also the quality of the pipe; thus, the manufacturer does not face any issues regarding maintenance of the quality and the standard of the pipe. The manufacturer should be responsible for promoting regular testing, and thus, any problems and difficulties with the clay pipe are also detected. It is also required to encourage the training of the employees, and therefore, it helps to promote the development of their performance and leads to the improvement of the quality of the pipe. The proper culture and technology are also required to be implemented, and thus, it helps to promote the appropriate development of the quality of the clay pipe(Ramesh et al., 2020).

Chapter 3: Methodology

3.1: Overview

The methods of research by which the researchers will conduct the whole research are discussed in this part. The methodology is an essential part of the research and the proper research is conducted through a correct sequence to get appropriate results and also the conclusion of the study.

3.2: Research philosophy

It helps to understand the proper theory, which helps to make an interpretation of the topic of the research. The researchers also get the appropriate research results through understanding the proper theory. Three different research philosophies are interpretivism, positivism and also realism. As well as this particular research, the researchers will follow the interpretivism research philosophy, which will help to understand the proper theory which is associated with the quality control system of the clay pipe(Pandey and Pandey, 2021).

3.3: Research Approach

The researchers get the proper way to conduct the research through the research approach. Inductive and deductive are two types of research approaches. The inductive approach is used by the research in the case of the secondary data collection process. Moreover the researchers are aware of the proper way of collecting data from secondary and also primary sources. The

researchers will choose the inductive research approach, and this will help to maintain the proper data collection for the study; in this particular research,

3.4: Research strategy

Research strategy helps the researchers to promote the proper strategy and conduct the whole research. In this research, the grounded theory will be followed by the researchers and thus, the researchers will get the appropriate way to conduct the entire research. The researchers will use the qualitative strategy, and thus, they will get the data and information from the sources that have already been published.

3.5: Research choice

In every research, it is essential to choose the proper choice of research, and thus, it helps to achieve the goals and objectives of the research. In this particular research, the mono methods will be chosen by the researchers. Thus, the researchers will be focused on one method, and thus, the collection of the data of the research will be more accessible. Apart from the mono method, there is a mixed method, and the multi-method is also used by different researchers (Mishra and Alok, 2022).

3.6: Data collection

The researchers will collect the data based on the topic. There are two types of data collection processes one is the primary and another is the secondary. In this particular research, the researchers will collect the data through secondary qualitative methods, and thus, they will collect the information from secondary sources, including journals, articles and also websites (Verma, Verma and Abhishek, 2024).

3.7: Data analysis

Data analysis is essential to get the proper findings, and thus, the researchers make the appropriate conclusion of the research. The researchers analysed the data collected from different sources. In this particular research, the researchers will analyse the data through thematic analysis, and thus, the researchers will make some themes and promote the analysis.

3.8: Ethical consideration

The researchers will adequately maintain the proper ethics when they collect information from secondary sources. The researchers will choose peer-reviewed articles and also the article which is accessible to everyone (Newman and Gough, 2020).

3.9: Limitation

The researchers will follow the secondary process, and thus, they will not get the primary information, and the researchers will not get the actual real and also recent information, which will be the limitation of this research.

3.10: Timeline

Actions	Start date	End date	Duration
Choose the Topic	02-04-2024	04-04-2024	2
set the aims and objectives	04-04-2024	08-04-2024	4
choose the literature	08-04-2024	30-04-2024	22
conducted the methodology	30-04-2024	12-05-2024	12
Collect the data	12-05-2024	03-06-2024	22
analysis the data	03-06-2024	28-06-2024	25
discuss the findings	28-06-2024	13-07-2024	15
Making conclusion	13-07-2024	28-07-2024	15

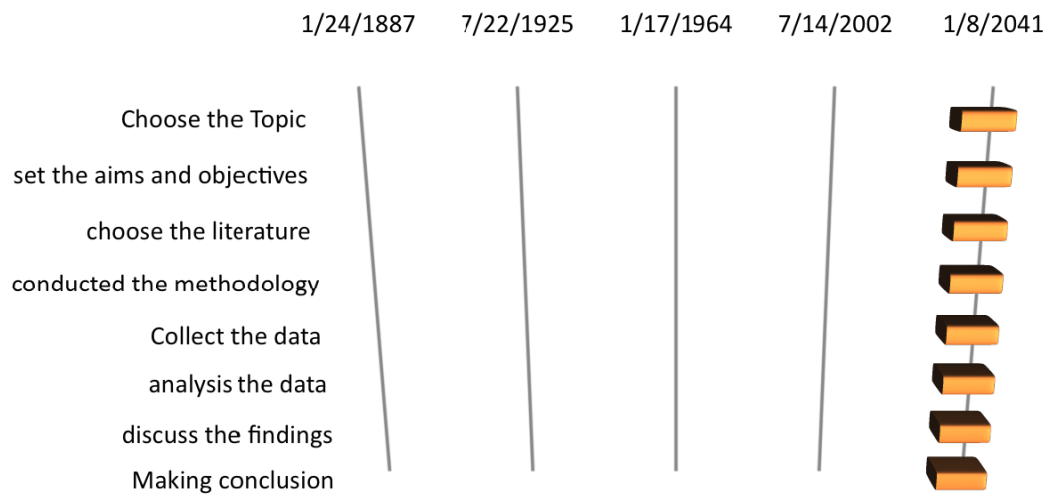


Figure 1: Gantt chart

(Source: Self-developed)

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