**CHAPTER THREE**

**RESEARCH METHODOLOGY**

Research Methodology

Data collection is a major aspect of any type of research study. The number one problem caused by low-quality data is the risk you take when using that data to make important business decisions. If your data is full of errors, that means any data analysis you run could be [completely and utterly wrong](https://www.insightsquared.com/2014/09/what-to-do-when-the-numbers-lie/)

Data Collection

This study was carried out at the Aniniwaah Medical Center. In order to address the above mention problem/challenges, the study employed the qualitative research design and in particular the interpretive case study research approach. Data for the study was collected through observation and interview.

A quantitative analysis technique was used as a result of it permitting us to solicit for data from an outsized range of participants which was simple analyses and taken. The motivation to use a qualitative analysis approach was additionally fueled by the probability to realize a deeper study into the character of medical treatment in the Aniniwaah Medical Center.

With these two approach in the analysis, I was able together all the desired data regarding the activities of Aniniwaah Medical Center I Kumasi. Activities like taking personal details, running of test and figuring of the patient’s result were clearly explained by the responder

Software Development Methodology

For a software projects to be successful, there must be a plan for action, realization of different steps.

Models provide a detailed plan of action of the system under construction, this provide blueprint of the system. Also unsuitable project methodology leads to project failure making it useless to the end-users. the waterfall software development methodology will be opted for this project.

The **waterfall model** is a relatively linear sequential design approach for certain areas of engineering design. In software development, it tends to be among the less iterative and flexible approaches, as progress flows in largely one direction ("downwards" like a  waterfall) through the phases of conception, initiation, analysis, design ,construction ,testing , deployment and maintenance .

The waterfall development model originated in the manufacturing and construction industries; where the highly structured physical environments meant that design changes became prohibitively expensive much sooner in the development process. When first adopted for software development, there were no recognized alternatives for knowledge-based creative work.

The advantages of waterfall development are that it allows for departmentalization and control. A schedule can be set with deadlines for each stage of development and a product can proceed through the development process model phases one by one.

Some of the major advantages of the Waterfall Model are as follows −

* Simple and easy to understand and use
* Easy to manage due to the rigidity of the model. Each phase has specific deliverables and a review process.
* Phases are processed and completed one at a time.
* Works well for smaller projects where requirements are very well understood.
* Clearly defined stages.
* Well understood milestones.
* Easy to arrange tasks.
* Process and results are well documented.



Figure 1: Waterfall Methodology

**Development Tools and Platform**

This section gives a clear detail on the programming languages, IDEs, Frameworks and the platforms used in the project to achieve the scope.

PHP

PHP is server-side\_ scripting language design for web development but also used as a general-purpose programming language. Originally created by Rasmus Lerdorf in 1994, the PHP reference implementation is now produced by the PHP Group originally stood for personal Home page, but it now stands for the recursive backronym PHP: Hypertext Preprocessor

PHP code may be embedded into HTML code, or it can be used in combination with various web template systems, web content management system and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a model in web the web server or as a common Gateway interface(CGI) executable. the web server combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated web page. PHP code may also be executed with a command-line interface(CLI) and can be used to implement standalone graphical applications.

MYSQL Server

MySQL was created by a Swedish company, [MySQL AB](https://en.wikipedia.org/wiki/MySQL_AB), founded by [David Axmark](https://en.wikipedia.org/wiki/David_Axmark), Allan Larsson and [Michael "Monty" Widenius](https://en.wikipedia.org/wiki/Michael_(Monty)_Widenius). Original development of MySQL by Widenius and Axmark began in 1994.[[26]](https://en.wikipedia.org/wiki/MySQL#cite_note-26) The first version of MySQL appeared on 23 May 1995. It was initially created for personal usage from [mSQL](https://en.wikipedia.org/wiki/MSQL" \o "MSQL) based on the low-level language [ISAM](https://en.wikipedia.org/wiki/ISAM), which the creators considered too slow and inflexible. They created a new [SQL](https://en.wikipedia.org/wiki/Structured_Query_Language) interface, while keeping the same [API](https://en.wikipedia.org/wiki/Application_programming_interface) as mSQL. By keeping the API consistent with the mSQL system, many developers were able to use MySQL instead of the (proprietarily licensed) mSQL antecedent.

**MySQL** is an open-source relational database management system(RDBM) Its name is a combination of "My", the name of co-founder Michael Widenius’s daughter,and "SQL", the abbreviation for Structured Query Language. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. For proprietary use, several paid editions are available, and offer additional functionality.

**Benefits of using MYSQL Database**

Whether you are a Web developer, CNESM, or a dedicated network administrator with an interest in building database applications, MySQL is easy to use, yet extremely powerful, secure, and scalable. And because of its small size and speed, it is the ideal database solution for Web sites.

Some of its advantages include the following:

* *It's easy to use*:

While a basic knowledge of SQL is required—and most relational databases require the same knowledge—MySQL is very easy to use. With only a few simple SQL statements, you can build and interact with MySQL.

* *It's secure*:

MySQL includes solid data security layers that protect sensitive data from intruders. Rights can be set to allow some or all privileges to individuals. Passwords are encrypted.

* *It's inexpensive*:

MySQL is included for free with NetWare® 6.5 and available by free download from [MySQL Web site](http://www.mysql.com/).

* *It's fast*:

In the interest of speed, MySQL designers made the decision to offer fewer features than other major database competitors, such as Sybase\* and Oracle\*. However, despite having fewer features than the other commercial database products, MySQL still offers all of the features required by most database developers.

* *It's scalable*:

MySQL can handle almost any amount of data, up to as much as 50 million rows or more. The default file size limit is about 4 GB. However, you can increase this number to a theoretical limit of 8 TB of data.

* *It manages memory very well*:

MySQL server has been thoroughly tested to prevent memory leaks.

* *It supports Novell Cluster Services*:

MySQL on NetWare runs effectively with Novell® Cluster Services™, letting you add your database solution to a Novell cluster. If one server goes down, MySQL on an alternate server takes over and your customers won't know that anything happened.

* *It runs on many operating systems*:

MySQL runs on many operating systems, including Novell NetWare, Windows\* Linux\*, many varieties of UNIX\* (such as Sun\* Solaris\*, AIX, and DEC\* UNIX), OS/2, FreeBSD\*, and others.

* *It supports several development interfaces*:

Development interfaces include JDBC, ODBC, and scripting (PHP and Perl), letting you create database solutions that run not only in your NetWare 6.5 environment, but across all major platforms, including Linux, UNIX, and Windows.

**JavaScript**

**JavaScript** often abbreviated as **JS**, is a [high-level](https://en.wikipedia.org/wiki/High-level_programming_language), [interpreted](https://en.wikipedia.org/wiki/Interpreted_language) [programming language](https://en.wikipedia.org/wiki/Programming_language). It is a language which is also characterized as [dynamic](https://en.wikipedia.org/wiki/Dynamic_programming_language), [weakly typed](https://en.wikipedia.org/wiki/Weak_typing), [prototype-based](https://en.wikipedia.org/wiki/Prototype-based_programming) and [multi-paradigm](https://en.wikipedia.org/wiki/Multi-paradigm_programming_language).

Alongside [HTML](https://en.wikipedia.org/wiki/HTML) and [CSS](https://en.wikipedia.org/wiki/CSS), JavaScript is one of the three core technologies of the  to execute it.

As a multi-paradigm language, JavaScript supports [event-driven](https://en.wikipedia.org/wiki/Event-driven_programming), [functional](https://en.wikipedia.org/wiki/Functional_programming), and [imperative](https://en.wikipedia.org/wiki/Imperative_programming) (including [object-oriented](https://en.wikipedia.org/wiki/Object-oriented_programming) and [prototype-based](https://en.wikipedia.org/wiki/Prototype-based_programming)) [programming styles](https://en.wikipedia.org/wiki/Programming_paradigm). It has an [API](https://en.wikipedia.org/wiki/Application_programming_interface) for working with text, [arrays](https://en.wikipedia.org/wiki/Array_data_type), dates, [regular expressions](https://en.wikipedia.org/wiki/Regular_expression), and basic manipulation of the [DOM](https://en.wikipedia.org/wiki/Document_Object_Model), but the language itself does not include any [I/O](https://en.wikipedia.org/wiki/Input/output), such as networking, storage, or graphics facilities, relying for these upon the host environment in which it is embedded.

Initially only implemented [client-side](https://en.wikipedia.org/wiki/Client-side) in web browsers, JavaScript engines are now embedded in many other types of host software, including [server-side](https://en.wikipedia.org/wiki/Server-side) in web servers and databases, and in non-web programs such as word processors and [PDF](https://en.wikipedia.org/wiki/Portable_Document_Format) software, and in runtime environments that make JavaScript available for writing mobile and desktop applications, including desktop widgets. [World Wide Web](https://en.wikipedia.org/wiki/World_Wide_Web). JavaScript enables interactive [web pages](https://en.wikipedia.org/wiki/Web_page) and thus is an essential part of [web applications](https://en.wikipedia.org/wiki/Web_application). The vast majority of [websites](https://en.wikipedia.org/wiki/Website) use it, and all major [web browsers](https://en.wikipedia.org/wiki/Web_browser) have a dedicated [JavaScript engine](https://en.wikipedia.org/wiki/JavaScript_engine)

**Hypertext Markup Language** (**HTML**) is the standard markup language for creating web pages and web applications. Web browsers receive HTML documents from a web server   or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

HTML element are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by *tags*.

**Conclusion**

The various Software development models have their own strength and weaknesses. Timing an essential in software development, if a delay in then development phase, competitor’s will always take the lead. Therefore, there should be an adjustment between the development time and the quality of the product. Customers don’t expect a bug free product but they expect a user-friendly product, that is the reason why I opted for waterfall Methodology.