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Printing Performance between Wired and Wireless Printing Services Using Four Configurations

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Abstract
To print is defined as to produce a softcopy or a machine copy into a mechanical or hard copy of the document. An example of printing process is to produce text and graphics from a computer screen into a sheet of paper.This study entitled "PRINTING PERFOMANCE BETWEEN WIRED AND WIRELESS PRINTING SERVICES USING FOUR CONFIGURATIONS" was conducted to evaluate the printing performance between wired and wireless printing services using four configurations. These are; Configuration one (wired printer and wired client); Configuration two (wired printer and wireless client); Configuration three (wireless printer and wired client); and Configuration four (wireless printer and wireless client). Two units of personal computers were used; one computer served as a client and the other one was set as the print server. Stopwatch was used to determine the printing performance between wired and wireless network using four configurations. Experimental research design was used to compare which among the four configurations is better in the time to commence printing. Mean and Kruskal-Wallis H were the statistical tools used to analyze the gathered data in the research. Printer was categorized as independent variable while the time to commence printing was identified as the dependent variable. Findings showed that the printing performance of configuration two, which is wired printer, with wireless client produced the fastest time to commence printing. Meanwhile, the configuration three was found to be the least responsive in its time to commence printing. Lastly, findings also showed that there was significant difference in the time to commence printing between wired and wireless printing using four configurations.

Keywords: *Printing performance, wired configuration, wireless configuration, printing services, printer*

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I. Introduction

The concept of communication technology relies greatly on communication mediums Wired and Wireless. Printers vary in size, speed, sophistication, and cost. In general, more expensive printers are used for higher-resolution color printing[1]. Most wired printers use USB for direct connection, allowing the printer and computer to communicate at high speeds for data transfer. These types of printersare usually easy to install, and in many cases your personal computers (PC's) operating system may be able to automatically detect and install drivers to help you get started. Most USB printers can be converted to a wireless printer with an adapter. Both Wi-Fi and Bluetooth adapters are available from printer manufacturers as well as third-party manufacturers[2].

In the paper of[3][4], they observed that the physical condition of printer and the environment in which it operates are key indicators of the reliability of its performance during periods of high print demand. In[5], looked at how printing is done, particularly by computer-based or digital printers have been rather different from the kind of machine found in a commercial print works, there was no relationship in the way they were used or the way they worked. When choosing a printer configuration, one of the options you have to consider is how the printer connects to a computer. Most printers use a direct connection to a single computer, although many offer the ability to connect to a wired or wireless network for easy sharing. This motivates to the researcher to conduct such study comparing the time to commence printing between wired and wireless printing using four configurations. Also, this is a study similar to the previous study entitled "COMPARATIVE STUDY BETWEEN WIRED AND WIRELESS PRINTING SERVICES" but the researcher increases the distance and added obstruction as factors for this study.

On the other hand, [6] discussed that due to the advance technology of today, smart printing is commonly used. There are number of computers are sharing one printer in a network. 3-D printing was also used in the university for the use in their laboratories, makerspaces, or fablabs[7]. It is also used in construction industries by the Engineers[8].

Moreover, in the study of [9][10][11][12][13]states that the wireless network is measured based on large amount of data being transferred in a very short specified time. Meaning fast internet with no degradation in performance all the time. While wired network is considerably simple in connecting. He touches on some

concerns regarding wired connections by saying factors like port availability come into play not to mention physically running the cables..

In this context, this study was attached upon and conceptualized based from the theory cited. Theory states that in wired printer, computer communicates to printer at high speed. Thus, the researchers conceptualized that there is a difference on time to commence printing between wired and wireless printer using different configurations. This study discusses the average time to commence printing of different configuration; configuration one (1)-a wired printer and wired client, configuration two (2)- wired printer and wireless client, configuration three (3)- wireless Printer and wired client, and configuration four (4)- wireless printer and wireless client. Also, this study discussed the difference on the time to commence printing between four configurations. Figure 1 shows the paradigm of the study.

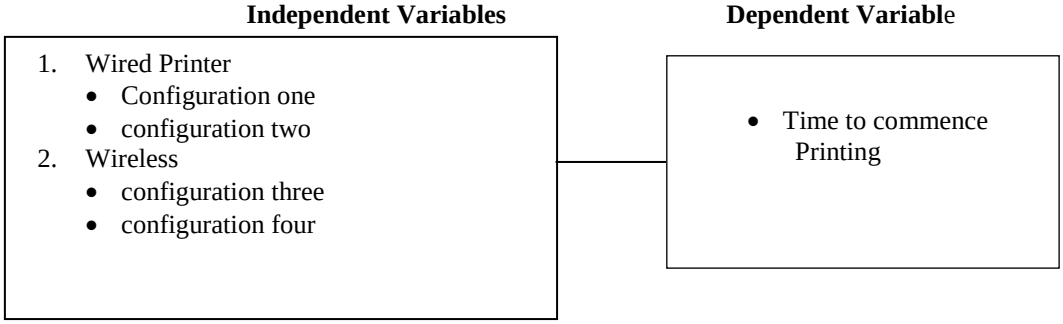

Figure 1.The paradigm of the Study

Advancement in printing services continued to progress. In the midst of this is to choose between wired printers and wireless printers. Obviously, one has advantage over the other. For instance, wired printer offers stability as it is physically connected to a PC. On the other hand, wireless printers promote mobility as it can be transferred from one place to another without being messy with cables. Hence, there is a debate as to which of the two performs better under normal circumstances. It is on this premise that the researchers wanted to determine the performance between the two printers when configured in four different ways.

The main purpose of the study is to evaluate the time to commence printing between wired and wireless printing services using four configurations. This also intend to determine whether significant difference exist on time to commence printing between wired and wireless printing using four different configurations.

II. METHODOLOGY

Experimental research design was used in this study. According to[14], in scientific studies, experimental design is the gold standard of research designs. This methodology relies on random assignment and laboratory controls to ensure the most valid, reliable results. Although researchers recognize that correlation does not mean causation, experimental designs produce the strongest, most valid results. However, experimental design is often not practical for many studies in social science, education and business because researchers cannot, in many instances, exercise laboratory controls in natural-world setting or randomly assign subjects. Research designs range from descriptive case studies, often employed in anthropology, to the experimental approach.

This experimental study compared which among the four configurations is better in time to commence printing. Configuration one -a wired printer and wired client, configuration two - wired printer and wireless client, configuration three - wireless printers and wired client, and configuration four (4) – wireless printer and wireless client.

Much of the progress in the sciences comes from performing experiments. These may be of either an exploratory or a confirmatory nature. In the book published by[15],they discussed about the validity and reliability concepts of using experimental and quasi-experiment research design in applied linguistic research. According to[16],experimental research is an attempt by the researcher to maintain control over all factors that may affect the result of an experiment. This methodology relies on random assignment and laboratory controls to ensure the most valid, reliable results.

In this study, the researcher focused on printing services of wired and wireless printing using four different configurations. In configuration one, the printer is connected to the print server via printer cable; the print server is wired to a router which also physically connects the router to the client computer using UTP cable. The experiment was conducted three times. Figure 1 shows the configuration One.

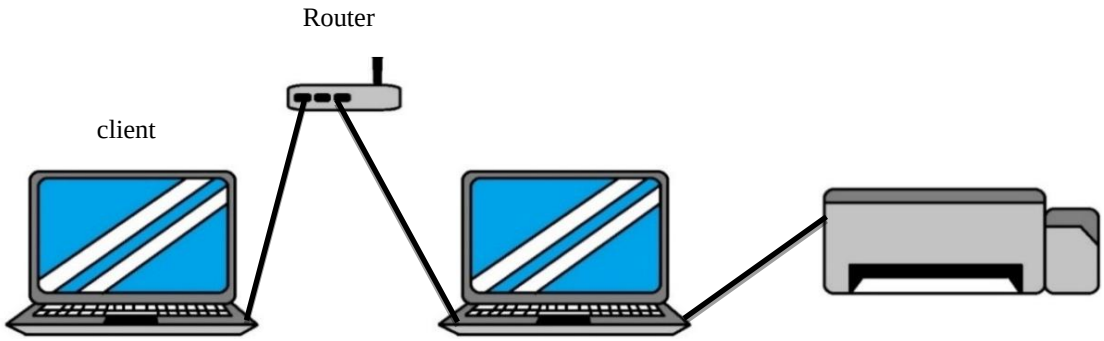

Figure 1. Configuration One

In configuration two, the printer is connected to the print server via printer cable; the print server is wired to a router using UTP cable while the client computer is wireless connected to the router. The experiment was conducted three times. Figure 2 shows the configuration two.

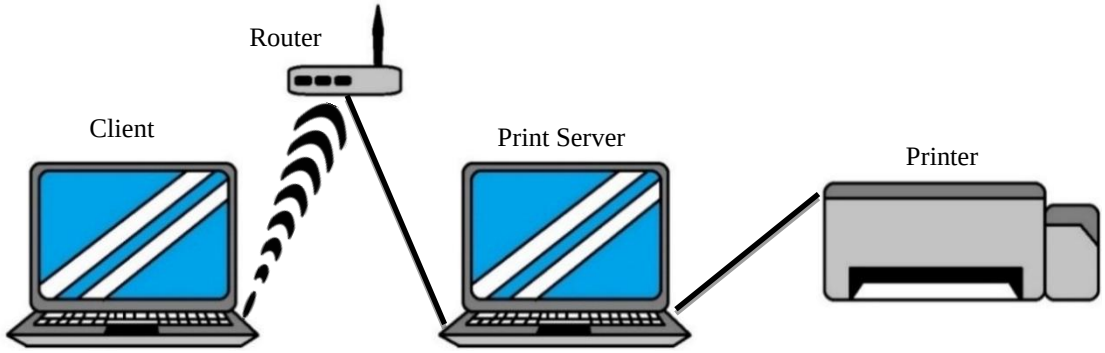

Figure 2. Configuration two

In configuration three, the printer is wireless connected to the print server; the print server is wired to a router which also physically connects to the client computer using UTP cable. The experiment was conducted three times. Figure 3 shows the configuration three.

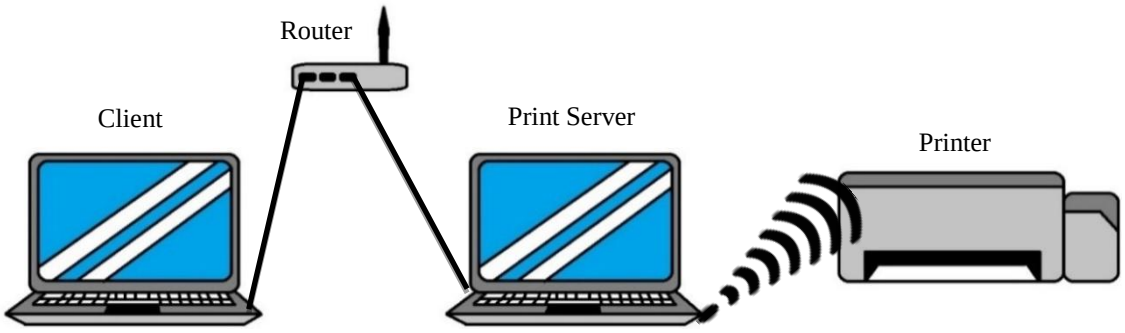

Figure 3. Configuration Three

In configuration four, the printer is wireless connected to the print server; the print server is physically connects to router using UTP cable and the router is wireless connected to the client computer. The experiment was conducted three times. Figure 2 shows the configuration three.

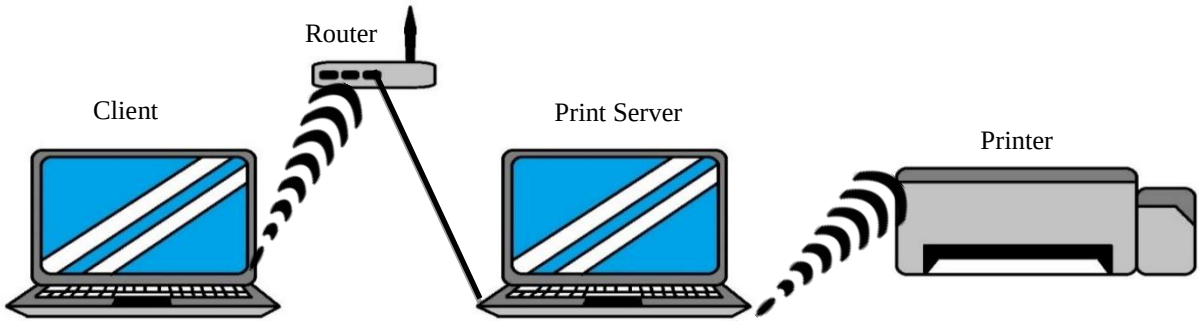

Figure 4. Configuration Four

After the installation of the printer, the print server shared the printer to the network, and enabled the client to connect to the printer.The researcher then tested the time to commence printing using different configurations. To determine the time to commence printing of different configurations, the researcher used stopwatch to record the time on each printing using the four configurations.

III. RESULTS AND DISCUSSION

The data gathered during the experiment were subjective to descriptive data analysis. The tool used was Mean statistics.

Average Time to Commence Printing of Wired and Wireless Printing Using Configuration One, Configuration Two, Configuration Three, and Configuration Four

Using the mean to evaluate the time to commence printing of wired and wireless printer, the results are as follows; in Configuration one, using wired printer and wired client, the results revealed that the time to commence printing was equivalent to 5.84 seconds. In Configuration Two using wired printer and wireless client, the mean was 4.67 seconds. In Configuration three using wireless printer and wired client, the mean was 7.26. Lastly, in Configuration four using wireless printer and wireless client, the mean was 6.15. Figure 5 shows the time to commence printing of four configurations.

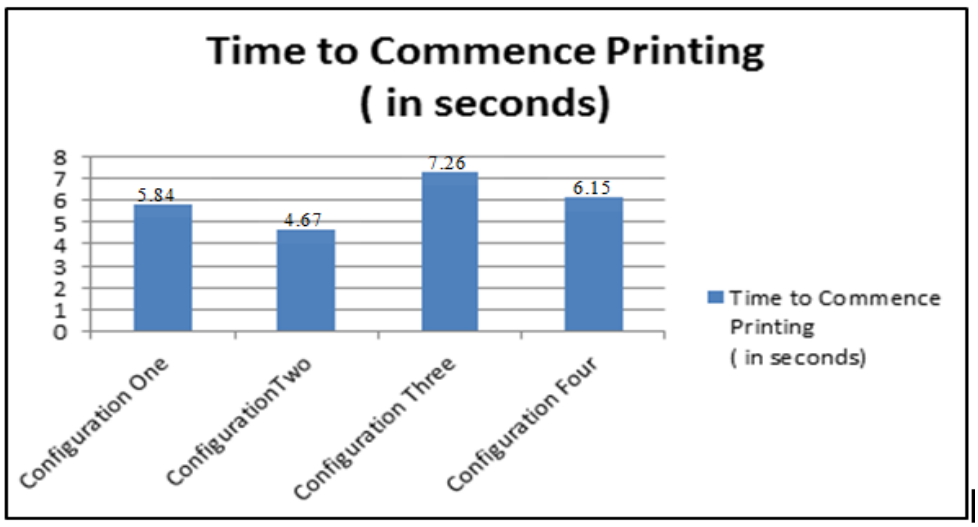

Figure 5. Time to commence printing of four configurations

The difference on time to commence printing between wired and wireless printing using four (4) configurations was subjected to inferential data analysis. The Kruskal-Wallis H was used.

Significance Difference on Time to Commence Printing Between the Four Configurations.

Table below shows the significant difference on time to commence printing between four (4) configurations. Based on the results, the Asymp significance was .016. This value is lower than 0.05 less of significance. Thus, the result revealed that there was significant difference on time to commence printing between four (4) configurations.

Table 1. Significant difference on time to commence printing between four (4) configurations

Categories	Kruskal-Wallis H	Computed Significance	Interpretations
Between four configurations	10.29	0.016*	Significant

*Significant at <0.05 alpha level

IV. CONCLUSION

The researcher was able to arrive at these conclusion based on the findings of the study. The study revealed that the Configuration two, being the most responsive in its time to commence printing and having a mean of 4.67 seconds, outperformed the other three configurations. Meanwhile, the configuration three was found to be the least responsive in its time to commence printing having a mean of 7.26 seconds. Lastly, study also showed that there was significant difference in the time to commence printing between wired and wireless printing using four configurations.

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