

# I. INTRODUCTION

The rapid growth of information technology (IT) in recent years has led to an increase in the demand for IT solutions. In the fields of communication technology, services, business, and various other aspects of a company, data management plays an important role in optimizing business performance and strategy. Furthermore, the effective data and information management is essential for companies that want to progress and grow. Hence, proper data processing could improve operational efficiency, encourages innovation, and provides a basis for evaluation and policy-making in the company [1].

In this case, PT Smartfren Telecom Tbk (Smartfren) is one of the leading telecommunication service providers in Indonesia, serving the retail and corporate segments. Operating since 2011, Smartfren introduced the first 4G Long Term Evolution (LTE) Advanced service in Indonesia in 2015 and currently has the widest 4G LTE coverage in Indonesia. Among the important data managed by Smartfren, especially in Surabaya branch office is Network Power System (NPS) data. This NPS data includes information such as Site ID, Site Name, Tagging (TAG), Final Assembly Code (FAC), Area, Rectifier Type, and IP Address of the rectifier on various towers, which are stored with conventional way like Microsoft Excel format. Moreover, NPS data is critical to managing their network infrastructure.

Currently, NPS data management method has some inefficiencies. It is because based on interviews with a Networking team, several problems often arise due to in-updating data, lack of systematic data updates, and difficulties in accessing the most accurate and up-to-date information. This leads to time inefficiencies, as employees often have to manually match old and new data to determine validity. Currently, approximately three thousand of NPS data regularly undergoing changes due to tower modifications, however, the current data management system is inadequate.

To overcome this problem, the use of information technology is very important to improve efficiency and quality in data management [2]. For example, a web-based platform is a viable solution, offering greater accessibility and flexibility than conventional way [3]. Through the implementation of a website to manage NPS data, it will allow for easier and real-time access for employees, supporting continuous operations and 24-hour availability. Hence, web-based development is appropriate and feasible solution, given the rapid development of technology and the growing need for efficient data management in enterprises.

The previous studies mentioned that develop the website need a proper methodology such as an Agile software development approach [4]. Agile is designed to deliver high-quality software that can adapt to changing needs over time [5]. Under Agile approach, the Extreme Programming (XP) method is well suited for this project due to its emphasis on simplicity, iterative development, and direct user involvement [6]. XP is known for its flexibility and risk mitigation, making it ideal for projects with evolving requirements [7]. Furthermore, the development process follows four phases of XP method, such as planning, design, coding, and testing to ensure a robust and user-accepted software [8].

The previous studies have shown the effectiveness of web-based solutions using the XP methodology in a variety of contexts, that is develop the web-based information dissemination and trainee selection tests showed a significant improvement in accessibility and usability [9]. Similarly, develop the inventory management systems highlight the utility of XP in creating effective data logging and tracking tools [10].

Therefore, this study aims to develop a Network Power System (NPS) Website using the XP method and evaluate its quality through Black-box Testing and User Acceptance Testing (UAT). The goal is to provide solutions that meet the specific needs of companies, ensuring efficient and reliable data management.