## 1. Introduction

### Background

Technological advances are currently growing rapidly and have been applied in various fields, including government, education, and tourism [1], [2], [3]. Practicum is an important part of the student learning process, especially in programming, because it provides experience in applying knowledge by formulating problems, designing programs, fixing errors or bugs, and compiling reports [4]. Effective learning strategies include methods, facilities and infrastructure, materials, and media designed to facilitate the achievement of learning objectives [5], [6]. Conventional learning methods such as lecture, discussion, and question and answer are often used in practicum activities [7]. According to Sumiarni, the lecture method that only involves students as listeners without encouraging them to think actively in the learning process can reduce students' learning motivation, which ultimately has an impact on their learning outcomes [8].

However, in reality, there are various obstacles in the implementation of practicum. One of the main problems found is the lack of student motivation in participating in practicum activities. Based on a survey conducted on students majoring in Software Engineering, Telkom University Purwokerto, it was found that 56% of 30 respondents felt less motivated or lazy to take part in practicum activities. The lack of interesting learning methods used in practicum is one of the factors that cause students to lack active participation. In addition, the lack of interaction between students and lecturers in the practicum process also hinders student involvement in understanding the material presented.

Lack of student motivation is a problem that is often found and without realizing it can cause a decrease in the effectiveness of practicum activities due to the lack of active students during practicum. Teaching staff such as lecturers and practicum assistants are required to find ways to increase student motivation to be more active during practicum activities [9]. One method to increase student motivation is to implement gamification, which is a strategy that integrates game elements into non-game related applications or systems [10]. Gamification is an innovative technique that incorporates game elements, such as feedback, leaderboards, and point collection, into non-game activities to increase engagement and participation [11]. Gamification has many elements such as points, badges, challenges, leaderboards, levels, avatars, rewards, performance graphs, storylines, etc. [12], [13].

Based on these problems, this research aims to design and develop a gamification-based student activeness monitoring system that is applied in practicum activities. The system will use various gamification elements, such as points, challenges, badges, and leaderboards, to help increase students' motivation to be active in practicum activities. To achieve these goals, this research will use the Rapid Application Development (RAD) method, which allows system development to be carried out quickly and efficiently [14], [15]. In addition, system modeling will be done using the Unified Modeling Language (UML) to provide a clear representation of the structure and workflow of the system to be developed [16].

The output of this research is a website-based practicum student activeness monitoring system called **Class Rank**. With this system, it is expected that students will be more motivated to take practicum and be more active in learning activities in practicum classes. In addition, the implementation of this system is expected to assist lecturers in monitoring student activeness more systematically through the gamification mechanism applied. In the end, this research is expected to contribute to the development of more effective and interesting learning methods for students.

### Topics and Boundaries

Based on the background that has been described, there is a research problem formulation, namely that there are still many students who feel less motivated and bored when participating in practicum activities which cause a lack of student activeness in practicum activities. A system is needed that can increase student motivation to be more active in practicum activities. It takes methods such as gamification in practicum activities to increase student motivation and activeness, and also a system that can monitor the activeness of the students themselves.

The problem limitations in this research include several aspects, namely system development that only focuses on the website platform and research subjects that are limited to the practicum student activeness monitoring system in the Software Engineering study program, Telkom University Purwokerto. In addition, the gamification elements used in this system include points, challenges, badges, and leaderboards.

### Objectives

The output of this research is a website-based practicum student activeness monitoring system called **Class Rank**. With this system, it is expected that students will be more motivated to take practicum and be more active in learning activities in practicum classes. In addition, the implementation of this system is expected to assist lecturers in monitoring student activeness more systematically through the gamification mechanism applied. In the end, this research is expected to contribute to the development of more effective and interesting learning methods for students.

### Writing Organization

This research article is divided into 4 chapters. Chapter 1 covers the background, research topics and limitations, and research objectives. Chapter 2 discusses related studies which are previous studies that intersect

or have similarities with this research. Then Chapter 3, discusses related system development which in this study uses the Rapid Application Development (RAD) method from start to finish. Chapter 4 discusses system evaluation, namely with Blackbox Testing and also User Acceptance Testing (UAT). Conclusions related to this research will be described in the last chapter, namely Chapter 5.