

# CHAPTER I

## INTRODUCTION

### 1.1 Research Background

A concert is a musical performance held live in front of an audience and presented to fans through the work of a singer or music group. Concerts are increasingly evolving into spontaneous experiences, and attending music concerts is now seen as a popular way to pay homage to favorite musicians or music groups. Not only that, the existence of music concerts also opens up a variety of opportunities, such as becoming a professional promoter, building infrastructure, and scheduling to tour (Hidayatullah, 2021).

On the campus of Universitas Pendidikan Ganesha, the *Malam Gelar Seni* (MGS) concert is one of the most anticipated activities every year. Because MGS itself is the culmination of a series of activities that are usually organized by student organizations from various faculties and departments, one of which is the Student Executive Board of the Faculty of Engineering and Vocational in a series of *Pagelaran Akhir Tahun* (PAT) activities, namely TWEAK. The event was successfully held in 2022 and 2023, with 2,417 tickets sold in 2022 and 3,226 tickets sold in 2023. The concert is not only limited to the academic community but also open to the general public, thus providing an opportunity for anyone to enjoy the concert.

Ticket sales for the *Malam Gelar Seni* (MGS) concert on the campus of Universitas Pendidikan Ganesha are still done manually. Participants can order tickets through direct chat with the committee or buy them directly at a

predetermined location and time. Ticket sales are carried out in stages, starting from pre-sale 1, pre-sale 2, and so on to on the spot (OTS), with different prices. This method of ticket sales often causes various obstacles from the side of the committee and the buyer. According to I Kadek Bayu Danu Artha (21 years old) as the Treasurer of TWEAK 7 and 8, this method makes it difficult for the committee to manage stock and record the number of tickets sold accurately. Errors often occur due to human error, such as forgetting to record, and require more energy to serve buyers directly. Meanwhile, from the buyer's perspective, booking tickets through private chats with the organizers often led to long lines. This triggers complaints from buyers, especially regarding delays in response, as the organizers have to reply to messages one by one.

To overcome these problems, the implementation of an e-ticketing system is an effective solution. E-ticketing is a form of innovation in the field of e-commerce that can be processed without having to issue paper tickets, and all ticket information is stored digitally so as to reduce costs and increase user flexibility (Dwijayani, et al., 2022). The e-ticketing system serves to assist users in obtaining ticket sales services as efficiently as possible (Gohil, et al., 2019). By implementing an e-ticketing system on MGS concert ticket sales, it can reduce the cost of using paper, and users can buy tickets anywhere and anytime.

However, the use of e-ticketing systems has its own challenges in its implementation, especially in ticket war, which is the process of people fighting over tickets online. When many users make transactions in close proximity, there is a possibility of ticket ID conflicts that allow more than one user to purchase tickets with the same ID in the transaction data, which causes overselling. This is due to a

race condition where there are two requests at the same time, and both can order the same item. This problem is tricky to debug because it only arises when multiple concurrent requests occur (Li, et al., 2024).

Based on research conducted by Anwari (2021) with the title “*Implementasi Optimistic Concurrency Control pada Sistem Aplikasi E-Commerce Berdasarkan Arsitektur Micro Services Menggunakan Kubernetes.*”. Concurrency issues were tested using two approaches: with Optimistic Concurrency Control (OCC) and without OCC. Of the three tests using OCC, no concurrency issue was found. However, of the six tests without OCC, three of them showed concurrency issues. Thus, the optimistic concurrency control approach can be used to prevent concurrency issues. In addition, the e-ticketing system also faces challenges in the process of checking tickets by the committee when the event is in progress. When the number of attendees is very large, of course the committee will have difficulty verifying tickets quickly and accurately. Therefore, this research will discuss the implementation of optimistic locking in the digitization of MGS ticket sales at Universitas Pendidikan Ganesha to prevent overselling, with supporting features to verify tickets using QR codes, so as to optimize the transaction process and ticket checking.

Based on the description above, the author intends to conduct research with the title “**Implementing Optimistic Locking to Digitize Ticket Sales for Malam Gelar Seni at Undiksha.**”.

## 1.2 Problem Identification

Based on the background description above, the problems in this study can be identified as follows:

1. Ticket sales for the *Malam Gelar Seni* (MGS) concert at Universitas Pendidikan Ganesha are still done manually.
2. Manual ticket sales methods make it difficult to manage, record sales, and require more manpower from the committee side.
3. The manual ticket sales method inhibits buyers in terms of space and time because buyers are required to come directly to the sales location.
4. The e-ticketing system allows errors to occur in the ticket transaction process, namely when many users make transactions in close proximity, which causes more than one user to make transactions on the same ticket ID.
5. The committee has difficulty checking tickets, especially when many participants come during the event.

## 1.3 Problem Scopes

Based on the problem identification presented, the problem restrictions in this study are as follows:

1. Designing and developing an e-ticketing system using optimistic locking for digitizing ticket sales for the *Malam Gelar Seni* (MGS) concert at Universitas Pendidikan Ganesha.
2. Optimistic locking used to prevent overselling in the e-ticketing system of *Malam Gelar Seni* (MGS) Universitas Pendidikan Ganesha.
3. The development of the MGS e-ticketing system is limited to the Faculty of Engineering and Vocational at Universitas Pendidikan Ganesha.

4. Testing the developed e-ticketing system to test the performance of optimistic locking to prevent overselling by using load testing and system usability using the System Usability Scale (SUS).
5. Load testing is only done on the ticket reservation process, without covering the payment process or other features on the e-ticketing system.
6. In load testing, the number of requests in the test is varied from 100, 250, 500, 750 to 1000 requests.
7. Load testing is done with 1 ticket per transaction, so do not test the scenario of purchasing more than 1 ticket per transaction.
8. Testing with SUS questionnaire consists of 10 standard questions with a scale rating of 1-5.
9. In SUS testing, respondents were asked to use the e-ticketing system directly before filling out the questionnaire.
10. In SUS testing, the minimum number of respondents involved in SUS testing is 15 people.

#### **1.4 Research Problem Statements**

Based on the background that has been described, the problem formulations used in this study are as follows:

1. How is the e-ticketing system designed using the optimistic locking method to digitize ticket sales for the *Malam Gelar Seni* (MGS) concert at Universitas Pendidikan Ganesha?
2. How is the e-ticketing system design implemented in the development of the *Malam Gelar Seni* (MGS) application at Universitas Pendidikan Ganesha?



3. How is the performance and usability of the e-ticketing system for the Malam Gelar Seni (MGS) concert at Universitas Pendidikan Ganesha evaluated?

### 1.5 Research Objectives

Based on the formulation of the problem above, the objectives of this study are as follows:

1. To design an e-ticketing system using optimistic locking to digitize ticket sales for the *Malam Gelar Seni* (MGS) concert at Universitas Pendidikan Ganesha.
2. To Implement the designed e-ticketing system in the development of the *Malam Gelar Seni* (MGS) concert application at Universitas Pendidikan Ganesha.
3. To evaluate the performance and usability of the e-ticketing system for the *Malam Gelar Seni* (MGS) concert at Universitas Pendidikan Ganesha through system testing and user testing.

### 1.6 Research Result Benefits

The benefits of this research can be divided into two categories, namely, theoretical and practical, depending on the background, problem formulation, and research objectives that have been explained in the previous subchapters.

#### 1. Theoretical Benefits

This research is expected to expand knowledge about the application of optimistic locking in the e-ticketing system. And can be used as a reference and material in the implementation of optimistic locking in the digitization of *Malam Gelar Seni* ticket sales at Universitas Pendidikan Ganesha to prevent overselling, with a support system to verify tickets using a QR code.

## 2. Practical Benefits

It is intended that the following parties can benefit from the practical application of this research in particular:

### a) Event Organizing Committee

The designed e-ticketing system can assist the concert committee in managing concert ticket sales more efficiently, reducing the labor required, reducing expenses for making paper tickets, and facilitating the ticket checking process.

### b) Buyer

This system provides convenience for prospective ticket buyers because ticket purchases can be made anytime and anywhere without having to come to the ticket sales location, thus saving energy and time.

### c) System Developer

The implementation of optimistic locking can serve as an example to prevent overselling in similar applications that involve many transactions in close proximity.

