BY

Mr. Krissanapong Palakham 6288102

Mr. Pongsakorn Piboonpongpun 6288107

Mr. Rathakit sriprachayanun 6288134

ADVISOR

asst. prof. Dr. charnyote pluempitiwiriyawej

A Senior Project Submitted in Partial Fulfillment of

the Requirements for

THE DEGREE OF BACHELOR OF SCIENCE

(INFORMATION AND COMMUNICATION TECHNOLOGY)

Faculty of Information and Communication Technology

Mahidol University

2019

**COPYRIGHT OF MAHIDOL UNIVERSITY**

ACKNOWLEDGEMENTS

Mr. Krissanapong Palakham

Mr. Pongsakorn Piboonpongpun

Mr. Rathakit Sriprachayanun

Mr. Krissanapong Palakham 6288102 ITCS/B

Mr. Pongsakorn Piboonpongpun 6288107 ITCS/B

mr. rathakit sriphachayanun 6288137 ITCS/B

B.Sc. (INFORMATION AND COMMUNICATION TECHNOLOGY)

PROJECT ADVISOR: asst. prof. dr. charnyote pluempitiwiriyawej

ABSTRACT

<Abstract content as sentence case here>

KEYWORDS :

P.

ITCS/B

ITCS/B

ITCS/B

วท.บ. (เทคโนโลยีสารสนเทศและการสื่อสาร)

อาจารย์ที่ปรึกษาโครงการ:

บทคัดย่อ

หน้า

**CONTENTS**

Page

[ACKNOWLEDGEMENTS ii](#_Toc433050262)

[ABSTRACT iii](#_Toc433050263)

[LIST OF TABLES iii](#_Toc433050264)

[LIST OF FIGURES iii](#_Toc433050265)

1. [Introduction 3](#_Toc433052088)

[1.1 Motivation 3](#_Toc433052089)

[1.2 Problem Statement 3](#_Toc433052090)

[1.3 Objectives of the Project 3](#_Toc433052091)

[1.4 Scope of the Project 3](#_Toc433052092)

[1.5 Expected Benefits 3](#_Toc433052093)

[1.6 Organization of the Document 3](#_Toc433052094)

1. [Background 3](#_Toc433052095)

[2.1 Literature Review 3](#_Toc433052096)

1. [Analysis and Design 3](#_Toc433052097)

[3.1 System Architecture Overview 3](#_Toc433052098)

[3.2 System Structure Chart 3](#_Toc433052099)

[3.3 Process Analysis and Design 3](#_Toc433052100)

[3.3.1 Data Flow Diagram 3](#_Toc433052101)

[3.3.2 Data Dictionary 3](#_Toc433052102)

[3.4 Database Analysis and Design 3](#_Toc433052103)

[3.4.1 ER-Diagram 3](#_Toc433052104)

[3.4.2 Relational Schema 3](#_Toc433052105)

[3.4.3 File Structure 3](#_Toc433052106)

[3.5 I/O Design 3](#_Toc433052107)

[3.5.1 Interface Design 3](#_Toc433052108)

[3.5.2 Transition Diagram 3](#_Toc433052109)

**CONTENTS (Cont.)**

1. [Implementation 3](#_Toc433052110)

[4.1 Hardware and System Environment 3](#_Toc433052111)

[4.2 Implementation Guide and Techniques 3](#_Toc433052112)

[4.2.1 <Guide/Technique/Know-how> 3](#_Toc433052113)

[4.2.2 < Guide/Technique/Know-how> 3](#_Toc433052114)

1. [Testing and Evaluation 3](#_Toc433052115)

[5.1 Unit Tests 3](#_Toc433052116)

[5.1.1 Test Performed on <Process Number> <Process Name> 3](#_Toc433052117)

[5.1.2 Test Performed on <Process Number> <Process Name> 3](#_Toc433052118)

[5.2 System Integration Test 3](#_Toc433052119)

[5.2.1 Test Scenario 3](#_Toc433052120)

1. [Conclusions 3](#_Toc433052121)

[6.1 Benefits 3](#_Toc433052122)

[6.1.1 Benefits to Project Developers 3](#_Toc433052123)

[6.1.2 Benefits to Users 3](#_Toc433052124)

[6.2 Problems and Limitations 3](#_Toc433052125)

[6.3 Future Work 3](#_Toc433052126)

[REFERENCES 3](#_Toc433052127)

[APPENDIX A 3](#_Toc433052127)

[BIOGRAPHIES 3](#_Toc433052129)

LIST OF TABLES

Page

[Table 3.1: List of all Processes 3](#_Toc433051533)

[Table 3.2: Process Description of <Process Name> 3](#_Toc433051534)

[Table 3.3: Process Description of <Process Name> 3](#_Toc433051535)

[Table 3.4: List of all Data Stores 3](#_Toc433051536)

[Table 3.5: Data Store Description of <Data Store Name> 3](#_Toc433051537)

[Table 3.6: Data Store Description of <Data Store Name> 3](#_Toc433051538)

[Table 3.7: List of All Data Elements 3](#_Toc433051539)

[Table 3.8: List of all Tables in Our System Database 3](#_Toc433051540)

[Table 3.9: File Structure of <Data Store Name> 3](#_Toc433051541)

[Table 5.1: <Test Name> 3](#_Toc433051542)

[Table 5.2: <Test Name> 3](#_Toc433051543)

LIST OF FIGURES

Page

[Figure 3.1: <Description of the Figure Above> 3](#_Toc433051683)

[Figure 3.2: <Description of the Figure Above> 3](#_Toc433051684)

[Figure 3.3: <Description of the Figure Above> 3](#_Toc433051685)

[Figure 3.4: <Description of the Figure Above> 3](#_Toc433051686)

[Figure 3.5: <Description of the Figure Above> 3](#_Toc433051687)

CHAPTER 1

# Introduction

In this chapter, there are 6 parts of introduction which are Motivation, Problem Statement, Objectives of the Project, Scope of the Project, Expected Benefits of the Project, and Organization of the Document. Their focus will be on how the application was developed, why there is a need for the application, and what were the benefits of the application.

(Example of Reference[1, 2])

## Motivation

Whether it is a training, preparation, or competing, the common problems with athlete are injuries and the illnesses. These problems can affect the physical training, performance of the athletes at that time, and the success of winning competitive. Therefore, to prevent these things, it is important to keep track of athletes regularly and monitor their health and ailments. Collecting the data from athlete tracking help personnel in many fields such as the coaches of the athlete, the information can help them for planning about training and competition session, the medical teams (e.g., general practitioners, specialists, physical therapists), the information can help to know the predominant injury and illness type so that it can prevent and treat injury and illness in that time. Other information besides illness and injury also affects training and competition such as stressing level, athlete sleep time or else that effect to athletes meatal. So, these are very important to check for the athletes to have a more stable mind and better intentions.

## Problem Statement

Collecting data from the Athletes via Questionnaires form is difficult to manage in terms of sorting out between Medical team and Athletes. To make athletes feel comfortable to use our application is also hard to analyze since we need to get the feedback from athletes as much as possible.

## Objectives of the Project

In order to create the application, we provide

* Develop SIATS system capable of managing data on both sport injuries and sport psychology.
* Make it possible for athletes to monitor their present level of physical and mental wellness.
* Enable coaches and the medical staff to use athlete health data and provide coaching and treatment input to specific athletes

## Scope of the Project

A computing application that allows athletes to check their physical condition through online channels. The application is designed to facilitate both athletes and coaches and healthcare professionals with functionality that meets the needs of teams that care for athletes. Athletes and officials can view athlete statistics and check for ailments.

## Expected Benefits

In order to build the application, we expected our solution would be assisted to any kinds of users that were classified into two groups including users and developers. Furthermore, users were more classified into three groups including athletes, medical team, and organization agents. The description as follows:

* Athletes
  + Receiving a recommendation from medical team for healing themselves
  + Regularly receiving health checks with professional medical team
  + Filling out the health questionnaire forms as simple with clearly user interfaces
* Medical Team
  + Filling out the medical record form as simple with clearly user interfaces
  + Examining the cases from athletes clearly and easily
* Organization Agents
  + Making a decision in order to send athletes to compete in each event
  + Athletes’ and Medical Teams’ data in order to archive and analysis
* Developers
  + Practice using firebase in actual work.
  + Practice creating applications.
  + Developing the programming skills such as Dart.
  + Improving problem-solving skills.
  + Practice designing UX/UI

## Organization of the Document

This document consists of 6 chapters including:

1. Introduction – The motivation, problem statements, project objectives, project scopes, expected benefits for both users and developers, and document organization are all contained in the introduction's first chapter, which also introduces the project.
2. Background – Background knowledge, including a literature review, is included in the second chapter.
3. Analysis and Design – The project's analysis and design are presented in the third chapter. It includes details on the project's design, such as a system architecture overview, a system structure diagram, and a design for the web-based service.
4. Implementation – The fourth chapter discusses implementation and includes information on hardware, system environment, implementation techniques, and implementation guide.
5. Testing and Evaluation – The testing and evaluation process, spread pattern results, and discussion are all found in the fifth chapter.
6. Conclusion – Conclusion, benefits, issues and limitations, and future work are all included in the sixth chapter.

CHAPTER 2

# Background

## Literature Review

### The Oslo Sports Trauma Research Center questionnaire on health problems

Prior to recently, the majority of research on sports injury prevention consisted of observational studies that outlined injury risk in various activities as well as their incidence, pattern, and severity. Few studies, however, had been created to offer comprehensive data on injury processes and risk factors—data that was necessary in order to suggest appropriate preventative strategies. Based on this foundation, Oslo University Hospital and the Norwegian School of Sport Sciences collaborated to establish the Oslo Sports Trauma Research Center in May 2000. As a FIFA Medical Center of Excellence, the Oslo Sports Trauma Research Center was officially opened in 2009. The facility was also chosen to be one of the first four IOC Research Centers for Injury Prevention that year.

### Improved reporting of overuse injuries and health problems in sport

The OSTRC believes that these improvements will improve the respondents' experience and, as a result, maximize their adherence, and this paper offers updates to the OSTRC surveys. These impressions are influenced by environmental factors, including athlete experience, sport level, sport kind, and season. This implies that data gathered from various athletic cohorts won't necessarily be comparable. We support additional study on the psychometric characteristics of the OSTRC questionnaires in various contexts and groups. The OSTRC surveys have been used by users from a variety of sports research and therapeutic situations, and they have learned where they may be improved.

### Psychological Readiness of Athletes to Return to Play Following Injury

This study aimed to compile data on each athlete's mental state towards resuming play for every sport. All of demographic and research variables were estimated using descriptive statistics (means and standard deviations). Based on their reported psychological readiness to resume play, student-athletes were divided into two groups, Ready or Not Ready, using IPRS scores. All student-athletes with I-PRRS scores greater than or equal to 50 who scored extremely confidently were categorized as Ready (I-PRRS > 50). 8 All student-athletes with an I-PRRS score of less than 50 who did not score extremely confidently were labeled as Not Ready (I-PRRS 50).

Sleeping Quality

The purpose of sleep quality research is to examine how group methods can be used to address sleep issues in elderly individuals. The target group for this study consisted of 11 elderly individuals who had poor sleep quality. take part in group exercises 8 weeks were spent gathering general information. A daily sleep log and a sleep quality assessment.

Sleep is a vital process for maintaining life since it helps with biological recovery and balance between the mind and body. Poor sleep can have a detrimental impact on daily activities by impairing work and study performance, increasing the risk of accidents, and impairing social contact. Nevertheless, a growing number of patients experience sleeping difficulties and consequently seek medical attention. A particular method is needed for clinical screening and follow-up evaluations that not only assesses several elements of sleep issues to identify patients with sleep disorders early but also yields results that are comparatively consistent over time.

CHAPTER 3

# Analysis and Design

## System Architecture Overview

## System Structure Chart

|  |  |
| --- | --- |
|  | |
| Project :  System : | Major Advisor : |
| Description : | |

Figure 3.1: <Description of the Figure Above>

The detailed description of each subsystem is shown below:

1. –
   1. –
   2. –
2. –
   1. –
      1. –
         1. –
         2. –
      2. –
         1. –
         2. –
      3. –
3. –
   1. –
      1. –
      2. –
   2. –
      1. –
      2. –
      3. –
   3. –
      1. –
      2. –
4. –
   1. –
   2. –

## Process Analysis and Design

### Data Flow Diagram

|  |  |
| --- | --- |
|  | |
| Project :  System : | Major Advisor : |
| Description : | |

Figure 3.2: <Description of the Figure Above>

|  |  |
| --- | --- |
|  | |
| Project :  System : | Major Advisor : |
| Description : | |

Figure 3.3: <Description of the Figure Above>

|  |  |
| --- | --- |
|  | |
| Project :  System : | Major Advisor : |
| Description : | |

Figure 3.4: <Description of the Figure Above>

### Data Dictionary

A data dictionary is a way to document and describe Processes, Data Stores, and Data Elements (Data Flow) that occur in a Data Flow Diagram (DFD). It is composed of 3 parts as shown below.

* Process Descriptions
* Data Stores
* Data Elements

#### Process Description

This section will provide the detailed description of each process that exists in this system. It includes Inbound Data, Outbound Data, and Logic Summary.

Table 3.1: List of all Processes

| No. | Process | Name | Description |
| --- | --- | --- | --- |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |
| 6 |  |  |  |
| 7 |  |  |  |
| 8 |  |  |  |
| 9 |  |  |  |
| 10 |  |  |  |
| 11 |  |  |  |
| 12 |  |  |  |
| 13 |  |  |  |
| 14 |  |  |  |
| 15 |  |  |  |
| 16 |  |  |  |
| 17 |  |  |  |
| 18 |  |  |  |
| 19 |  |  |  |
| 20 |  |  |  |
| 21 |  |  |  |
| 22 |  |  |  |
| 23 |  |  |  |
| 24 |  |  |  |
| 25 |  |  |  |
| 26 |  |  |  |
| 27 |  |  |  |
| 28 |  |  |  |
| 29 |  |  |  |
| 30 |  |  |  |

Table 3.2: Process Description of <Process Name>

|  |  |
| --- | --- |
| Process Name | - |
| Description |  |
| Inbound data |  |
| Outbound Data |  |
| Logic Summary |  |

Table 3.3: Process Description of <Process Name>

|  |  |
| --- | --- |
| Process Name | - |
| Description |  |
| Inbound data |  |
| Outbound Data |  |
| Logic Summary |  |

#### Data Stores

This section describes the data stores that exist in the data flow diagram and consists of the Data Store Name, Description, Inbound Data, and Outbound Data.

Table 3.4: List of all Data Stores

| No. | Data Store | Name | Description |
| --- | --- | --- | --- |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |
| 6 |  |  |  |
| 7 |  |  |  |
| 8 |  |  |  |
| 9 |  |  |  |
| 10 |  |  |  |
| 11 |  |  |  |
| 12 |  |  |  |
| 13 |  |  |  |
| 14 |  |  |  |
| 15 |  |  |  |
| 16 |  |  |  |
| 17 |  |  |  |
| 18 |  |  |  |
| 19 |  |  |  |
| 20 |  |  |  |
| 21 |  |  |  |
| 22 |  |  |  |
| 23 |  |  |  |
| 24 |  |  |  |
| 25 |  |  |  |

Table 3.5: Data Store Description of <Data Store Name>

|  |  |
| --- | --- |
| Data Store Name | - |
| Description |  |
| Inbound data |  |
| Outbound Data |  |

Table 3.6: Data Store Description of <Data Store Name>

|  |  |
| --- | --- |
| Data Store Name | - |
| Description |  |
| Inbound data |  |
| Outbound Data |  |

#### Data Element

This section describes the data elements or data flows that exist in this system. The table below contains the list of all data elements belonging to their data element name, starting process/source/data store, and ending process/source/data store.

Table 3.7: List of All Data Elements

| SEQ | Data Element Name | From Process/Source/Data Store | To Process/Source/Data Store |
| --- | --- | --- | --- |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |
| 6 |  |  |  |
| 7 |  |  |  |
| 8 |  |  |  |
| 9 |  |  |  |
| 10 |  |  |  |
| 11 |  |  |  |
| 12 |  |  |  |

## Database Analysis and Design

### ER-Diagram

|  |  |
| --- | --- |
|  | |
| Project :  System : | Major Advisor : |
| Description : | |

Figure 3.5: <Description of the Figure Above>

### Relational Schema

This section describes the attributes of the tables in the database. The attribute notation is shown below.

* **Attributes** – which are bold and underlined are the Primary Keys
* *Attributes* – which are Italic are the Foreign Keys
* ***Attributes*** – which are bold, italic and underlined are both Primary Keys and Foreign Keys

Tables in this system can be divided into 3 groups as follows:

* Master File Table
* Base File Table
* Transaction File Table

Table 3.8: List of all Tables in Our System Database

| Table# | Table Name | Table Type | Description |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. Relational Schema of Master File Tables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

1. Relational Schema of Base File Tables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

1. Relational Schema of Transaction File Tables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

### File Structure

This section shows the details of each file component including field name, field description, field data type, field length, null value, primary key and foreign key.

Table 3.9: File Structure of <Data Store Name>

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table Name : |  | | | | | | Table# | |
| Table Type : |  | | | | | | | |
| Description : |  | | | | | | | |
| Field Name | | Type | Length | Description | Key | Reference | | Null |
|  | |  |  |  |  |  | |  |
|  | |  |  |  |  |  | |  |
|  | |  |  |  |  |  | |  |
|  | |  |  |  |  |  | |  |
|  | |  |  |  |  |  | |  |
|  | |  |  |  |  |  | |  |
|  | |  |  |  |  |  | |  |
|  | |  |  |  |  |  | |  |
|  | | Total |  | Bytes |  |  | |  |

## I/O Design

This section explains the design of the Input and Output User Interface. The section consists of two parts, the interface design and the transition diagram showing transition through the system.

### Interface Design

### Transition Diagram

CHAPTER 4

# Implementation

## Hardware and System Environment

* Operating System and Utilities Applications
* Web Server Software
* Editor
* Database Management System (DBMS)
* Programming and Scripting Tools
* Components

## Implementation Guide and Techniques

### <Guide/Technique/Know-how>

### < Guide/Technique/Know-how>

CHAPTER 5

# Testing and Evaluation

## Unit Tests

For the unit tests, we selected some important and critical processes for formal unit testing. The selected processes include:



### Test Performed on <Process Number> <Process Name>

Table 5.1: <Test Name>

|  |  |  |
| --- | --- | --- |
| Operation Performed | Condition Tested | Actual Result |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

### Test Performed on <Process Number> <Process Name>

Table 5.2: <Test Name>

|  |  |  |
| --- | --- | --- |
| Operation Performed | Condition Tested | Actual Result |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## System Integration Test

This activity is performed after the system is completely integrated. The purpose of this testing is to check whether the system can operate correctly according to the required functions or not.

### Test Scenario

In order to test all functional aspects of the system thoroughly, we had set up a test scenario which consisted of phases as shown below.

Moreover, the test scenario can be used as a user guideline because it covers all the steps necessary in order to use our system. The details of each phase are shown in the next section.

#### 

#### 

#### 

#### 

#### 

CHAPTER 6

# Conclusions

## Benefits

### Benefits to Project Developers

### Benefits to Users

## Problems and Limitations

## Future Work

REFERENCES

1. Author. *Title*. Series Title [Type of Medium] Year Last Update Date [cited Access Year Access Date]; Edition:[Description]. Available from: URL

2. Author, B., *Title*. Editon ed. Series Title, ed. S. Editor. Vol. Volume. Year, City: Publisher. Number of Pagers.

APPENDIX A

# <INSERT YOUR TOPIC>

BIOGRAPHIES

|  |  |
| --- | --- |
| NAME |  |
| INSTITUTIONS ATTENDED | , :  High School Diploma  Mahidol University, :  Bachelor of Science (ICT) |
|  |  |
| NAME |  |
| INSTITUTIONS ATTENDED | , :  High School Diploma  Mahidol University, :  Bachelor of Science (ICT) |
|  |  |
| NAME |  |
| INSTITUTIONS ATTENDED | , :  High School Diploma  Mahidol University, :  Bachelor of Science (ICT) |