Universiti Teknologi MARA

Techtic: A Hybrid Decision Support System For Football Tactics Using Rule-Based Selection and Generative AI

Faris Haikal Bin Basarudin

Thesis submitted in fulffilment of requirements for Bachelor of Information Technology (Hons.) Faculty of Computer and Mathematical Sciences

July 2025

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious, the Most Merciful.

First and foremost, I would like to express my utmost gratitude to **Allah SWT** for granting me the strength, patience, and perseverance to successfully complete this Final Year Project. Without His blessings and guidance, this journey would not have been possible.

I wish to extend my sincere thanks to my supervisor, **Miss Maznie binti Manaf**, for her continuous support, guidance, and constructive feedback throughout the course of this project. Her dedication and encouragement have been instrumental in helping me stay focused and achieve my objectives.

My deepest appreciation goes to my beloved parents, for their endless love, prayers, and sacrifices. Their unwavering belief in me has been my greatest motivation and source of strength throughout this academic journey.

I would also like to thank all my lecturers, classmates, and everyone who directly or indirectly contributed to the success of this project. Your presence and support have meant more than words can express.

This degree journey has not been easy. Adapting to a new environment, culture, and meeting new people was a challenge I never expected to face so deeply. At times, I struggled, trying to find my place, understanding unfamiliar surroundings, and missing what was once comfortable. But through these challenges, I found growth. I made new friends, found supportive people around me, and slowly began to cherish the very place I once resisted. I will never forget how the place I once disliked the most ended up being the one that brought tears to my eyes as I prepared to leave. To everyone who made my degree journey brighter , thank you. You have coloured my university life with memories I will carry forever. This campus and its people will always hold a special place in my heart. Thank you for teaching me what it truly means to be a friend, how to love, and how to be loved. Our paths may now take different turns, but may they one day cross again.

Lastly, my sincere gratitude goes to Universiti Teknologi MARA (UiTM) for providing me with the opportunity and platform to grow academically and personally throughout this journey.

ABSTARCT

The absence of available and easy-to-use tools can make the process of organizing teams and creating an effective tactical strategy challenging to amateur football managers. The current tactical solutions are professional in nature and hence complex, costly and not fit to be used by the grassroots. To fill this gap, TechTic was created as a hybrid decision support system using mobile-based architecture to allow rule-based logic and generative artificial intelligence to deliver tactical advice to suit the needs of non-professional users. A TechTic AI engine proposes the correct formations depending on the attributes of the players like position and key roles. This is further complemented by an inbuilt AI API which provides tactical advice based on context when the user feeds in details about the opposition team. Among the most important characteristics are the drag-and-drop formation editor, automatic placement of key players and suggestions based on natural language input created by the artificial intelligence. This system was created with Android Studio and Firebase to manage data in real time and the development process is based on the Waterfall methodology. Requirement Traceability Testing, System Usability Scale (SUS) and User Acceptance Testing (UAT) were used to test the performance and usability of the system. The outcomes indicated that there was a high usability, accessibility, and user satisfaction. TechTic can help close the tactical knowledge gap that exists between professional and amateur football, providing community coaches and grass roots managers with an intelligent, but easy to use, tactical planning tool. TechTic is a new milestone in accessibility to top-notch sports technology, with the option to be scaled to other sports teams in the future.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

This chapter provides a comprehensive study introduction by presenting background information along with the problem definition, research inquiries, goals, boundaries, importance, projected effects, and study constraints. The research explores the problems amateur sports managers encounter while team organization and strategic planning yet demonstrates how technology can help resolve these problems. The study defines its objectives alongside a breakdown of the solution features and potential effects together with a recognition of its constraints.

1.1 Background of Study

The effective management of sports is heavily reliant on the strategic planning process, team structure and tactical decision-making to facilitate the competitive success (Guidotti et al., 2023). But the sports managers in amateur sports, including school coaches or local non-paid volunteers, lack access to the professional tools, data, or advisory systems that professional clubs have (Sonesson et al., 2024). Consequently, such managers might not be able to develop successful formations, analyze their opponents or make data-based tactical decisions.

Despite the fact that technology has continued to revolutionize the sports industry, most of the existing solutions are either professional oriented or are complex to be used by amateurs. This leaves a gaping hole that needs user friendly, intelligent tools that meet the needs of grassroots managers. According to Rein and Memmert (2016), even though data and digital systems have increasingly become relevant in sports, there is still a shortage of