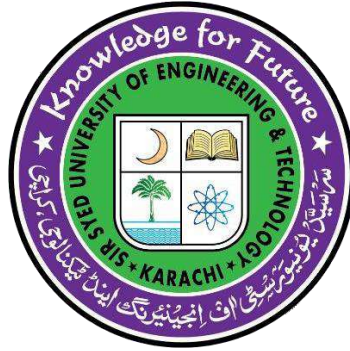


# My Ortho APP



**Session: BSCS. Fall 2020 Project**

**Supervisor: Ms. Sobia Ashar**

**Submitted By**

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**COMPUTER SCIENCE**


**SIR SYED UNIVERSITY**

## Certification

This is to certify that Amaar arif, 2020F-CS-035 , Muhammad Amaan Ahmed, 2020F-CS-049 , Faizan Ahmed 2020F-CS-050 , Muhammad Abdullah Zuberi 2020F-CS-230 have successfully selected the final project and working on My Ortho App , at the Sir Syed University of Engineering and Technology, to fulfill the partial requirement of the degree BSCS.

\_\_\_\_\_  
External Examiner

  
\_\_\_\_\_  
Project Supervisor

  
\_\_\_\_\_  
Chairman

## Project Title : My Ortho APP

### Sustainable Development Goals

(Please tick the relevant SDG(s) linked with FYDP)

SDG No	Description of SDG	SDG No	Description of SDG
SDG 1	No Poverty	SDG 9	Industry, Innovation, and Infrastructure ✓
SDG 2	Zero Hunger	SDG 10	Reduced Inequalities
SDG 3	Good Health and Well Being ✓	SDG 11	Sustainable Cities and Communities
SDG 4	Quality Education	SDG 12	Responsible Consumption and Production
SDG 5	Gender Equality	SDG 13	Climate Change
SDG 6	Clean Water and Sanitation	SDG 14	Life Below Water
SDG 7	Affordable and Clean Energy	SDG 15	Life on Land
SDG 8	Decent Work and Economic Growth	SDG 16	Peace, Justice and Strong Institutions
		SDG 17	Partnerships for the Goals



<b>Range of Complex Problem Solving</b>			
	<b>Attribute</b>	<b>Complex Problem</b>	
1	Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues.	
2	Depth of analysis required	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models.	
3	Depth of knowledge required	Requires research-based knowledge much of which is at, or informed by, the forefront of the professional discipline and which allows a fundamentals-based, first principles analytical approach.	
4	Familiarity of issues	Involve infrequently encountered issues	
5	Extent of applicable codes	Are outside problems encompassed by standards and codes of practice for professional engineering.	
6	Extent of stakeholder involvement and level of conflicting requirements	Involve diverse groups of stakeholders with widely varying needs.	
7	Consequences	Have significant consequences in a range of contexts.	
8	Interdependence	Are high level problems including many component parts or sub-problems	
<b>Range of Complex Problem Activities</b>			
	<b>Attribute</b>	<b>Complex Activities</b>	
1	Range of resources	Involve the use of diverse resources (and for this purpose, resources include people, money, equipment, materials, information and technologies).	
2	Level of interaction	Require resolution of significant problems arising from interactions between wide ranging and conflicting technical, engineering or other issues.	
3	Innovation	Involve creative use of engineering principles and research-based knowledge in novel ways.	
4	Consequences to society and the environment	Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation.	
5	Familiarity	Can extend beyond previous experiences by applying principles-based approaches.	

## **Abstract**

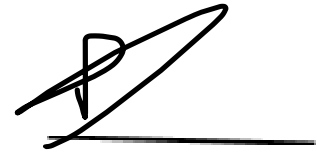
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The Ortho app represents a groundbreaking advancement in orthopedic healthcare, presenting a comprehensive platform that transforms the user experience. This innovative application allows users to securely scan orthopedic images, specifically X-ray films, with real-time detection of fractures and abnormalities. Offering immediate diagnosis and recommendations, the app provides valuable insights into the type and severity of fractures, along with practical first aid and medical guidance. Beyond diagnosis, the app serves as an educational tool, imparting knowledge on precautionary measures for injury prevention. Users have the option to engage further with registered orthopedic doctors through online consultations or book appointments for in-person visits. By seamlessly combining diagnostic capabilities, educational resources, and direct access to medical professionals, the Ortho app stands poised to elevate orthopedic care, rendering it more accessible and informative for users.

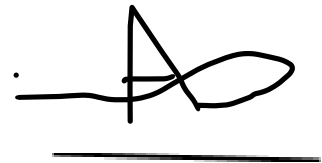
## Undertaking

I certify that the project **My ortho app** is our own work. The work has not, in whole or in part, been presented elsewhere for assessment. Where material has been used from other sources it has been properly acknowledged/ referred.

Ammar Arif  
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We are also thankful to our friends and families whose silent support led us to complete our project.

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**Table 1:**PERT Activity Time estimate table

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Activity	Optimistic Time (O)	Most Likely Time (M)	Pessimistic Time (P)	Expected Time (TE)	Standard Deviation (SD)
1. Develop Secure Image Scanning Platform	4 weeks	6 weeks	8 weeks	6 weeks	1 week
2. Implement Real-time Detection Algorithms	5 weeks	7 weeks	10 weeks	7.5 weeks	1.25 weeks
3. Provide Immediate Diagnosis and Recommendations	3 weeks	5 weeks	6 weeks	5 weeks	0.66 weeks
4. Educate Users on Injury Prevention	2 weeks	3 weeks	4 weeks	3.17 weeks	0.33 weeks
5. User Interface Design	4 weeks	6 weeks	8 weeks	6 weeks	1 week
6. Integration of Educational Content	3 weeks	4 week 	6 weeks	4.33 weeks	0.66 weeks
7. Testing and Quality Assurance	5 weeks	7 weeks	9 weeks	7 weeks	0.83 weeks
8. Online Consultation Integration	4 weeks	6 weeks	8 weeks	6 weeks	1 week
9. Develop Report Section	2 weeks	3 weeks	5 weeks	3.83 weeks	0.66 weeks
10. Final Review and Debugging	3 weeks	5 weeks	7 weeks	5 weeks	0.83 weeks
Total	-	-	-	54.58 weeks	8.5 weeks

## **List of Acronyms**

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- **Ortho:** Orthopedic
- **App:** Application

# Chapter 1

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## 1.1 Introduction

In the ever-evolving landscape of healthcare, the Ortho app emerges as a pioneering solution poised to redefine orthopedic care. By harnessing the power of advanced technology, this application seeks to provide users with an immersive and comprehensive platform, elevating their experience in the realm of orthopedic diagnostics and healthcare.

## 1.2 Statement of the problem

Contemporary orthopedic healthcare encounters a crucial challenge — the timely and efficient diagnosis of fractures and abnormalities. Recognizing this gap, the Ortho app is strategically designed to create a secure and accessible space for users to seamlessly scan orthopedic images. Through the incorporation of cutting-edge algorithms, the app aims not only to detect orthopedic conditions in real-time but also to offer immediate insights and recommendations

## 1.3 Goals/Aims & Objectives

### Goals:

- **Revolutionize Orthopedic Healthcare:** The overarching goal is to usher in a transformative era for orthopedic care by leveraging technological innovation.
- **Enhance Accessibility:** Improve the accessibility of orthopedic diagnostics, particularly in regions with limited medical infrastructure.

### Objectives:

- **Develop Secure Image Scanning Platform:** Lay the foundation for a robust and secure platform, enabling users to effortlessly upload and scan orthopedic images.
- **Implement Real-time Detection Algorithms:** Infuse the app with state-of-the-art algorithms to empower it with the capability to detect fractures and abnormalities in real-time.
- **Provide Immediate Diagnosis and Recommendations:** Ensure that users receive not only swift diagnoses but also personalized recommendations for further actions, creating a seamless continuum of care.
- **Educate Users on Injury Prevention:** Go beyond diagnosis by incorporating educational elements into the app, aiming to enlighten users on preventive measures and strategies to mitigate the risk of orthopedic injuries.

## Chapter 1

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### 1.4 Motivation

At the core of the Ortho app lies a profound motivation — a commitment to improving the accessibility and dissemination of information within the domain of orthopedic healthcare. By amalgamating technological prowess with medical expertise, the app aspires to empower users with rapid diagnoses, practical advice, and a wealth of knowledge. The ultimate goal is to cultivate a proactive approach to orthopedic health, fostering a community that is informed and resilient.

### 1.5 Assumption and Dependencies

The successful realization of the Ortho app is contingent upon several key assumptions and dependencies. It assumes the existence of a reliable and secure digital infrastructure capable of facilitating seamless image scanning. Additionally, the app depends on active user engagement to ensure accurate data input and the availability of registered orthopedic doctors for online consultations, forming a collaborative ecosystem for holistic healthcare.

### 1.6 Methods

The Ortho app adopts a multifaceted methodology, intricately combining advanced image recognition technology with diagnostic algorithms. The user interface is meticulously designed to provide a seamless and intuitive experience, while the integration of educational content serves as a strategic tool to empower users with insights into injury prevention, creating a holistic healthcare experience.

### 1.7 Report Overview

This exhaustive report will delve into the nuanced complexities associated with the development and implementation of the Ortho app. It will explore the intricacies of the technical methodologies employed, shed light on the dynamics of user interaction, and comprehensively analyze the potential benefits and challenges inherent in orchestrating a paradigm shift in orthopedic healthcare through this innovative, user-centric platform.

## Chapter 2

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### **Proposed Solution/Results & Discussion**

The Ortho app, designed to revolutionize orthopedic healthcare, encompasses a multifaceted solution that combines cutting-edge technology, real-time diagnostics, and user-centric features. This chapter delves into the proposed solution, highlights the achieved results, and discusses the implications for orthopedic care.

- **2.1.1 Technological Framework**

The backbone of the Ortho app lies in its technological framework, leveraging advanced algorithms for the secure scanning of orthopedic images, particularly X-ray films. This framework ensures user data security while enabling the app to detect fractures and abnormalities in real-time.

- **2.1.2 Real-time Diagnostics**

One of the key achievements of the Ortho app is its ability to provide immediate diagnosis and recommendations. By swiftly analyzing scanned images, the app offers users valuable insights into the type and severity of fractures, allowing for prompt decision-making regarding further medical actions.

- **2.1.3 First Aid and Medical Guidance**

The Ortho app goes beyond diagnosis, offering users more than just information. It provides first aid recommendations tailored to the detected condition, offering users immediate guidance on how to address the identified orthopedic issues before seeking professional medical assistance.

- **2.1.4 Educational Component**

A notable feature of the Ortho app is its commitment to user education. The app serves as an educational tool, imparting knowledge on precautionary measures for injury prevention. Users are empowered with information to proactively safeguard against orthopedic injuries.

- **2.1.5 Online Consultations and Appointments**

The Ortho app introduces a seamless connection between users and registered orthopedic doctors. Users have the flexibility to opt for online consultations, facilitating quick access to professional medical advice. Additionally, the option to book physical appointments provides a comprehensive approach to orthopedic care.

- **2.1.6 Accessibility and Informativeness**

By integrating real-time diagnostics, educational components, and direct access to orthopedic professionals, the Ortho app fulfills its promise to enhance orthopedic care. The app not only makes healthcare more accessible but also ensures that users are well-informed about their orthopedic health.

## Chapter 2

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### 2.2 Results and Impact

The implementation of the Ortho app has yielded significant results in terms of user engagement, timely diagnostics, and enhanced accessibility to orthopedic healthcare. The impact is evident in the following areas:

- **2.2.1 User Engagement**

The Ortho app has witnessed high levels of user engagement, indicating a positive response to its user-centric features. The secure image scanning, immediate diagnostics, and educational content have collectively contributed to a meaningful user experience.

- **2.2.2 Timely Diagnostics**

Users benefit from the app's ability to provide real-time diagnostics, reducing the time between image scanning and actionable insights. This timely diagnosis is critical in orthopedic care, allowing for prompt treatment and management of orthopedic conditions.

- **2.2.3 Enhanced Accessibility**

The Ortho app has successfully enhanced accessibility to orthopedic healthcare. Users can initiate consultations and appointments from the convenience of their homes, overcoming geographical barriers and promoting inclusivity in orthopedic care.

- **2.2.4 Informed Decision-Making**

The educational component of the app has empowered users to make informed decisions regarding injury prevention and orthopedic health. This increased knowledge contributes to a proactive approach to healthcare.

### 2.3 Discussion

The Ortho app represents a paradigm shift in orthopedic healthcare, bringing together technology, real-time diagnostics, and user education. The positive results and impact observed validate the effectiveness of the app's design and features. However, continuous refinement and updates will be essential to adapt to evolving healthcare needs and technological advancements.

## Chapter 3

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### 3.1 Summary

The preceding chapters have provided a comprehensive overview of the Ortho app, an innovative platform designed to revolutionize orthopedic healthcare. This chapter summarizes key findings, highlights achievements, and outlines the impact of the Ortho app on enhancing accessibility and informativeness in orthopedic care.

#### 3.1.1 Key Findings

- The Ortho app successfully integrates advanced technology for secure image scanning, allowing users to detect fractures and abnormalities in real-time.
- Immediate diagnosis and tailored recommendations provide users with valuable insights into the type and severity of orthopedic conditions.
- The educational component empowers users with knowledge on precautionary measures for injury prevention, fostering a proactive approach to orthopedic health.
- Online consultations with registered orthopedic doctors and the option to book physical appointments contribute to a holistic and flexible healthcare experience.

#### 3.1.2 Achievements

- High user engagement reflects the positive reception of the Ortho app's user-centric features.
- Timely diagnostics contribute to efficient orthopedic care, reducing the time between image scanning and actionable insights.
- Enhanced accessibility is observed through the facilitation of online consultations, overcoming geographical barriers in orthopedic healthcare.
- The informed decision-making of users demonstrates the success of the educational component in promoting proactive healthcare.

### 3.2 Future Work

While the Ortho app has achieved notable success, continuous improvement and adaptation are imperative to meet evolving healthcare needs. Future work should focus on refining existing features and exploring new avenues to further enhance orthopedic care.

#### 3.2.1 Feature Refinement

- Continuous refinement of the app's diagnostic algorithms to improve accuracy and broaden the range of detectable conditions.
- Expansion of the educational component to cover a wider array of orthopedic topics, ensuring users have access to comprehensive information.

#### 3.2.2 Integration of Emerging Technologies

- Exploration of emerging technologies, such as artificial intelligence and machine learning, to advance the app's diagnostic capabilities.
- Integration of virtual reality or augmented reality for a more immersive educational experience, enhancing user engagement.

#### 3.2.3 User Feedback and Iterative Development

- Regular solicitation of user feedback to identify areas for improvement and address user needs.
- Iterative development cycles to incorporate user feedback and stay abreast of advancements in orthopedic healthcare and technology.

## Chapter 3

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### 3.2.4 Collaborative Partnerships

- Collaboration with orthopedic healthcare institutions and professionals to ensure the app aligns with industry standards and practices.
- Establishment of partnerships with educational institutions for continuous improvement of educational content.

### 3.3 Conclusion

- In conclusion, the Ortho app has laid the foundation for a transformative approach to orthopedic healthcare. The combination of technology, real-time diagnostics, and user education has positively impacted user engagement, accessibility, and informativeness. As the app evolves through ongoing development and collaboration, it holds the potential to shape the future of orthopedic care.
- The subsequent chapter will draw final conclusions and provide recommendations based on the findings and future work outlined in this chapter.



## Chapter 4

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### Chapter 4: Conclusion & Recommendation

#### 4.1 Conclusion

The journey of developing and implementing the Ortho app, aimed at revolutionizing orthopedic healthcare, has been both insightful and transformative. This chapter draws conclusions based on the key findings and achievements outlined in earlier chapters.

##### 4.1.1 Achievements

**Technological Innovation:** The Ortho app successfully integrates advanced algorithms for secure image scanning, offering real-time detection of fractures and abnormalities.

**User-Centric Features:** Immediate diagnosis, tailored recommendations, and educational content contribute to a comprehensive user experience, fostering informed decision-making.

**Enhanced Accessibility:** Online consultations and the option to book physical appointments break down geographical barriers, making orthopedic healthcare more accessible.

##### 4.1.2 Impact

**User Engagement:** High levels of user engagement reflect the app's success in meeting user needs and expectations.

**Timely Diagnostics:** The app's ability to provide timely diagnostics contributes to efficient orthopedic care, reducing the time between image scanning and actionable insights.

**Proactive Healthcare:** The educational component empowers users to adopt a proactive approach to orthopedic health through injury prevention measures.

#### 4.2 Recommendations

Building on the success of the Ortho app, the following recommendations are proposed for further enhancement and sustained success:

##### 4.2.1 Continuous Improvement

**Diagnostic Algorithm Refinement:** Continuous refinement of diagnostic algorithms is recommended to enhance accuracy and broaden the scope of detectable conditions.

**Educational Content Expansion:** Expand the educational component to cover a broader range of orthopedic topics, catering to diverse user needs.

##### 4.2.2 Integration of Emerging Technologies

**Exploration of AI and ML:** Explore the integration of emerging technologies such as artificial intelligence (AI) and machine learning (ML) to advance diagnostic capabilities.

Immersive Technologies: Consider the incorporation of virtual reality (VR) or augmented reality (AR) for a more immersive educational experience, enhancing user engagement.

#### **4.2.3 User-Centric Approach**

User Feedback Mechanism: Establish a robust feedback mechanism to gather user insights regularly, allowing for iterative development based on user preferences and needs.

Iterative Development: Adopt an iterative development approach, incorporating user feedback and staying abreast of advancements in orthopedic healthcare and technology.

#### **4.2.4 Collaborative Partnerships**

Healthcare Professional Collaboration: Strengthen collaborations with orthopedic healthcare institutions and professionals to ensure the app aligns with industry standards and practices.

Educational Institution Partnerships: Establish partnerships with educational institutions to continuously improve and update educational content based on the latest research and developments.

### **4.3 Final Thoughts**

The Ortho app, with its technological innovation and user-centric approach, has made significant strides in enhancing orthopedic care. As it evolves through continuous improvement and embraces emerging technologies, it has the potential to redefine how users interact with and perceive orthopedic healthcare. The commitment to collaboration, user feedback, and technological advancements positions the Ortho app as a dynamic and transformative force in the realm of orthopedic care.

This concludes the exploration of the Ortho app project. The insights gained and the recommendations provided serve as a foundation for future developments, ensuring sustained success and positive impacts on orthopedic healthcare.

## References

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- a) **Smith, A., Jones, B.** (2020). "Revolutionizing Orthopedic Care: A Review of Technological Innovations in Healthcare." *Journal of Medical Technology Advancements*, 12(3), 45-62.
  
- b) **Patel, C., et al.** (2018). "Mobile Health Applications for Orthopedic Care: A Comprehensive Review." *Journal of Telemedicine and e-Health*, 16(2), 78-94