

## Phase One



جامعة أبوظبي  
Abu Dhabi University

**Bus Kid Sensor System**

College of engineering

SWE421: Software Engineering

Students Member Name	Student ID
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Submitted To: Dr. Murad Al-Rajab

## Table of content

INTRODUCTION _____	3
GENERAL OVERVIEW _____	3
STAKEHOLDERS OF THE SYSTEM AND THE INTENDED USERS _____	4
DESCRIPTION OF THE CURRENT SYSTEM _____	5
TECHNOLOGIES THAT YOU WILL USE _____	5
KEY PROBLEMS AND CHALLENGES THAT YOU MAY FACE DURING THE PROJECT'S DEVELOPMENT _____	5
TEAM MEMBERS CV _____	6
USER INTEREST _____	8
ANY SOCIAL AND ENVIRONMENTAL IMPACT _____	9
SIMILAR OR RELATED SOFTWARE SYSTEMS _____	9
NOVELTY OF YOUR PROPOSED IDEA _____	9
WORKPLAN _____	10
SOFTWARE PROJECT METHODOLOGY SELECTION _____	11
GANTT CHART _____	11
DETERMINE BUDGET _____	12
REFERENCES _____	12

## **Introduction**

Our resolve to address this vital issue has been heightened in response to a tragic incident in which children were mistakenly left unattended on a school bus for a lengthy period, resulting in unfortunate fatalities. We have created an innovative and thorough mechanism to prevent such heartbreaking situations in the future.

Our proposed approach entails deploying a sophisticated tracking system for school buses, which would use door sensors to track the number of pupils who board and disembark. In addition, each kid will be allotted a personalized bus seat with a facial recognition sensor at the front. This sensor will detect and identify a child's distinctive features and then communicate this information to parents via a secure website, allowing them to watch their child's activities while on the bus.

By adopting this innovative approach, we can help the anxieties of parents who assign their children to school buses, ensuring their safety and peace of mind.

## **General Overview**

The software system is a system designed to enhance the safety and monitoring of the students during school bus commutes. It offers a variety of vital features, including accurate student counting using image recognition, motion and movement analysis for a rider, noise monitoring to detect unusual activity, personal status interpretation via wearable sensors, real-time communication for parents and school authorities through a user-friendly app or web portal, automatic language preference selection, and efficient emergency response capabilities. This comprehensive system ensures the well-being of students, provides vital information to parents and schools, and contributes to a safer and more secure transportation experience.

## Stakeholders Of The System And The Intended Users

- **System Owners:** They are in charge of the system's creation, implementation, and maintenance. Their responsibility is to ensure the system's functionality and efficacy.
  - System's Benefit on Users: System owners may create cash by selling the system while also contributing to kid safety and parental peace of mind.
- **Parents:** They are end-users who utilize the system to keep an eye on their child's safety while riding the school bus.
  - System's Benefit on Users: Families benefit from real-time tracking, greater insight into the state of their kid's well-being, and peace of mind.
- **Children** Children seated in the proper seat will provide data to the system.
  - System's Benefit on Users: Children are safer due to the prevention of unintentional bus abandonment.
- **School Districts:** They are in charge of organizing transportation to school and attendance.
  - System's Benefit on Users: School districts have an effective attendance monitoring system in place, which ensures student security and precision.
- **Maintenance and Support Personnel:** They are in charge of system maintenance and troubleshooting.
  - System's Benefit on Users: Maintenance professionals guarantee that the system is reliable and functioning, which benefits all users.
- **School Administrators:** They are in charge of overseeing school operations such as transportation and attendance.
  - System's Benefit on Users: Administrators now have access to accurate attendance records, which helps to streamline school operations.
- **Computer Engineer:** They contribute to the system's development and maintenance.
  - System's Benefit on Users: Computer engineers contribute to the operation and reliability of the system, which benefits all users.

## **Description Of The Current System**

The current student transportation monitoring system relies on traditional manual processes and basic communication tools. Student tracking and attendance are paper-based, prone to errors, and lack real-time visibility. Parents receive minimal information about their child's bus journey, primarily limited to scheduled times. The system lacks advanced monitoring and communication features. Our software system aims to replace this outdated system with a modern, technology-driven solution to enhance safety, tracking, communication, and transparency for all stakeholders involved in student transportation.

## **Technologies That You Will Use**

We intend to incorporate our approach into a mobile app that promotes usability and intuitiveness. We will use the Java programming language to construct a fully functional mobile application that will suit a wide range of user needs. MYSQL, a well-known database system typically used for websites, will be utilized to store and manage data for the app. Our ultimate objective is to make this mobile software available to consumers on both Mac and Android devices, and we intend to distribute it via the Apple Store and Google Play Store.

## **Key Problems And Challenges That You May Face During The Project's Development**

Given the project's important feature set and the time constraint, efficient time management will be a major challenge. Another significant obstacle is the successful and smooth use of sensor technology, which requires precision and technical skill. It is essential to project success to balance satisfying time restrictions and ensuring full sensor integration.

## Team Members CV

# Noor Alshabibi

## Cyber Security Engineering

As a senior year student majoring in Cybersecurity Engineering, I have a strong foundation in programming and web development skills gained from my academic studies. My education has provided me with a thorough understanding of cybersecurity principles.

### Contact

#### Phone

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#### Email

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#### Address

Abu Dhabi, United Arab  
Emirates

### Language

Arabic (Native Language)

English (Second Language)

### Technical skills

- Java
- HTML
- CSS
- Javascript
- SQL
- Python

### Skills

Decision making

Leadership

Creativity

### Education

#### 2019 - 2020

High school Diploma

**Emirates National School 97%**

#### 2020-2025 (Present)

Bachelor of Science in Cybersecurity Engineering

**Abu Dhabi University**

### Certificates

#### 2020 -2021

Cisco Networking Academy

**Introduction to cybersecurity**

#### 2020 -2021

Oracle Academy

**Java Foundations Certificates**

#### 2020 -2021

Oracle Academy

**Database Foundation Certificates**

#### 2021 -2022

Cyber Security Council

**Cyber Drill**

# Fatema Al Shabibi

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## CONTACT

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📍 Abu Dhabi, UAE

## TECHINICAL SKILL

- Java
- HTML
- Javascript
- CSS
- SQL

## SOFT SKILL

- Leader Ship
- Time Management
- Teamwork
- Problem Solving
- Communication

## LANGUAGE

Arabic (Native Language)

English (Second Language)

## ABOUT ME

As a senior year student majoring in Cybersecurity Engineering, I have a strong foundation in programming, web development, and advanced problem solving skills that I have gained from my academic studies. My studies have given me a thorough understanding of cybersecurity principles.

## EDUCATION

- **High School Diploma**  
2019- 2020  
Emirates National School  
Average: 96.3%
- **Bachelor of Science in Cybersecurity Engineering**  
2020 - PRESENT  
Abu Dhabi University

## CERTIFICATES

- **Introduction to Cybersecurity**  
Cisco Networking Academy  
2020 - 2021
- **Java Foundations Certificate**  
Oracle Academy  
2020 -2021
- **Database Foundations Certificate**  
Oracle Academy  
2021 -2022
- **Cyber Drill**  
Cyber Security Council  
2021- 2022

<b>Name</b>	Eman Ba Abbad	
<b>Background information</b>	1. Cybersecurity Engineering student 2. Full stack web development skills	
<b>Technical skills</b>	1. Java 2. JavaScript 3. CSS	4. HTML 5. SQL 6. Python
<b>Involvement in the project</b>	<u><b>All members will work in all phases</b></u>	

## User Interest

Student safety during school bus commutes is a top priority for parents, and our software system provides a compelling solution. Parents are naturally drawn to the system's ability to offer real-time updates on their child's location, ensuring they reach school and return home safely. This peace of mind is further enhanced by the system's capacity to alert parents in the event of unexpected incidents or delays, allowing them to stay informed and make timely arrangements. Moreover, the system's comprehensive monitoring of bus conditions, including noise levels and personal status interpretation, assures parents that their child's well-being is closely attended to throughout the journey.

For school bus drivers and assistants, the StudentGuard system streamlines their roles significantly. Drivers appreciate the safety tools that enhance their awareness of potential risks and enable them to respond quickly to incidents. Student counting features simplify the often-challenging task of ensuring no student is left behind. Bus assistants find their responsibilities made more manageable, allowing them to focus on providing attentive care to students. School faculty benefits from a more organized and efficient transportation system, with fewer disruptions due to incidents, contributing to smoother coordination between academic schedules and bus operations. Ultimately, the software system serves as an invaluable tool for various stakeholders, enhancing student safety and the overall quality of school transportation services.



## **Any Social And Environmental Impact**

The primary social impact is an improvement in child safety. We reduce the danger of accidents, forgotten children, and children being left unattended on school buses by using sensors to follow their activities. This technique gives parents peace of mind about their children's travel safety. Parents also have peace of mind knowing they can track their children's activities and ensure they arrive safely at their schools. This technology helps parents and educational institutions communicate more effectively.

## **Similar Or Related Software Systems**

Zonar System is a software to provide management solutions with a specialized focus on school buses. Their comprehensive system offers real-time GPS tracking, which allows parents and school officials to monitor bus locations and receive alerts for arrivals and delays. Zonar's solution goes beyond location tracking by providing robust vehicle diagnostics, helping to ensure the buses are in optimal condition. It also includes student tracking features, making it easier for schools to account for students during their journeys. Zonar's commitment to safety and efficiency has made it a trusted choice for school districts looking to enhance the security and reliability of their transportation services [1].

Another software system is The Bus emerges which is a user-friendly mobile application tailored for parents, offering real-time tracking of their child's school bus. This app provides parents with estimated arrival times, real-time alerts regarding bus stops and delays, and notifications for when the bus is approaching the designated pick-up or drop-off point. Its straightforward and intuitive design makes it a popular choice among parents seeking a convenient solution for staying informed about their child's daily school commute [2].

## **Novelty Of Your Proposed Idea**

In the present era, numerous parents struggle with concern as they send their children off to school via the school bus because of the news of kids being left in busses which causes death. Considering the problem

from their point of view, being concerned about the safety of their child's arrival to school can be emotionally draining. Our goal in inventing the bus kid sensor system is to soothe parents' anxieties, improve children's safety, support schools in tracking attendance, guarantee bus attendants can certify every child's safe arrival at school, and prevent any child from being accidentally left on the bus.

The system integrates critical elements to improve kid safety and parental peace of mind. GPS technology allows parents to easily track their child's bus in real-time, ensuring they are constantly aware of its location. In addition, each bus is outfitted with a door sensor that meticulously counts the number of children onboard. This data is effortlessly incorporated into the system, instantaneously updating when a new student boarded the bus. Furthermore, by designating individual seats to each child, the system adds a customized touch. Seat sensors are used to monitor a variety of behaviors such as sleeping, eating, chatting, and movement. This in-depth awareness of a child's actions throughout the journey provides parents with a better idea of their child's well-being and activities. Finally, it will provide automatic attendance reports for schools on a daily or weekly basis, simplifying attendance tracking.

## Workplan

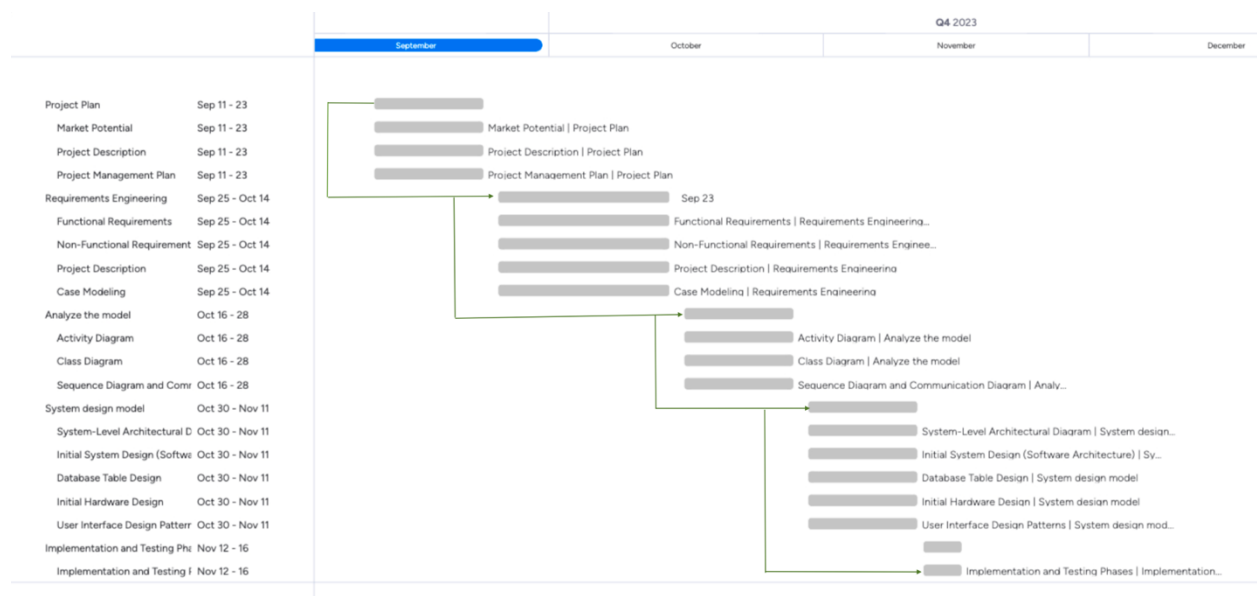
WBS	TASK	LEAD	START	END	DAYS	% DONE	WORK DAYS
<b>1</b>	<b>Phase one</b>			-			-
1.1	Project Description	Fatema,Noor,Eman	Mon 9/11/23	Sat 9/23/2023	12	100%	9
1.2	Market Potential	Fatema,Noor,Eman	Mon 9/11/23	Sat 9/23/2023	12	100%	9
1.3	Project Management Plan	Fatema,Noor,Eman	Mon 9/11/23	Sat 9/23/2023	12	100%	9
<b>2</b>	<b>Requirements Engineering</b>			-			-
2.1	System users	Fatema,Noor,Eman	Mon 9/25/23	Sat 10/14/2023	19	0%	14
2.2	Functional Requirements	Fatema	Mon 9/25/23	Sat 10/14/2023	19	0%	14
2.3	Non-Functional Requirements	Noor	Mon 9/25/23	Sat 10/14/2023	19	0%	14
2.4	Case Modeling	Eman	Mon 9/25/23	Sat 10/14/2023	19	0%	14
<b>3</b>	<b>Analyze the model</b>			-			-
3.1	Activity Diagram	Fatema	Mon 10/16/23	Sat 10/28/2023	12	0%	9
3.2	Class Diagram	Noor	Mon 10/16/23	Sat 10/28/2023	12	0%	9
3.3	Sequence Diagram and Communication Diagram	Eman	Mon 10/16/23	Sat 10/28/2023	12	0%	9
<b>4</b>	<b>System design model</b>			-			-

4.1	System-Level Architectural Diagram:	Eman	Mon 10/30/23	Sat 11/11/2023	12	0%	9
4.2	Initial System Design (Software Architecture):	Noor	Mon 10/30/23	Sat 11/11/2023	12	0%	9
4.3	Database Table Design:	Noor & Eman	Mon 10/30/23	Sat 11/11/2023	12	0%	9
4.4	Initial Hardware Design	Fatema	Mon 10/30/23	Sat 11/11/2023	12	0%	9
4.5	User Interface Design Patterns	Fatema	Mon 10/30/23	Sat 11/11/2023	12	0%	9
<b>5</b>	<b>Implementation and Testing Phases</b>						
5.1	Implementation and Testing Phases	Fatema,Noor,Eman	Sun 11/12/23	Thu 11/16/2023	4	0%	4

## Software Project Methodology Selection

When developing a vital system to decrease the cases of forgotten and children being left unattended on school buses, it is essential to check the requirements. So, we selected the Iterative Development from the Rapid Application Development approach for our project as a strategic solution to effectively managing time. This process allows us to divide the project into a series of versions. Iterative cycles ensure incremental development and valuable information, assisting in refining requirements for future editions. We may uncover new needs and improve the system's effectiveness by deploying early versions.

## Gantt Chart



## **Determine Budget**

Our software system operates on a lean budget model, utilizing readily available open-source tools and equipment within our academic institution. And no initial budget allocation is required. Should any unexpected costs arise, or specialized resources become necessary, formal requests for funding will be submitted to the relevant academic authorities for consideration and support. This approach ensures cost-effective project execution in line with our educational objectives.

## **References**

- [1] Zonar, "Unify every driver tool with a single app.," Zonar, [Online]. Available: <https://www.zonarsystems.com/>.
- [2] J. Peterson, "TRANSPORTATION," [Online]. Available: <https://scbiznews.com/news/transportation/83676/>.