

# **COMP 4910 Senior Project Design Project Presentation, Fall 2024**

## **GEMBOS: Global Encrypted Mobile-Based Obscured SMS Application**

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# Acknowledgements

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**A number of slides in this presentation has been prepared by using slides/figures from Effort Log Consolidated and DSD document of GEMBOS project**

# Motivation

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## **Securing Communication**

- Addressing vulnerabilities in global carrier networks due to SS7 protocol flaws and Man in the Middle attacks.
- Providing users with reliable platform for private and secure communication.

## **Advancing Cryptographic Solutions**

- Implementing various industry standards and techniques to enhance security.

## **Career and Practical Experience**

- Gaining hands-on experience with real world security implementations.
- Strengthening skills in secure software development and team collaboration.

# Outline

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- Introduction to GEMBOS
- Flow of the GEMBOS Project
- Consolidated Effort Log
- Conclusions

# Introducing GEMBOS

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- GEMBOS is a secure SMS application designed to protect communications from vulnerabilities.
- It employs Diffie-Hellman Key Exchange, Elliptic Curve Cryptography, and ISO/IEC 9798-3 standards to ensure secure key exchange, authentication, and message encryption.
- GEMBOS ensures all messages are encrypted, securely stored, and protected against unauthorized access while maintaining a user-friendly experience.

# Flow of GEMBOS Project

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1. Initial Research & Planning
2. Defining Requirements
3. Designing the Framework
4. Preparing Support Documents
5. Planning and Organization

# Consolidated Effort Log

Week	Dates	Giray Aksakal		Berker Vergi	
		Work Done	Total Hours Spent	Work Done	Total Hours Spent
Week 1	29.09.2024 - 05.10.2024	Defining project, objectives and team forming.	3	Defining project, objectives and team forming.	3
Week 2	06.10.2024 - 12.10.2024	Search for project advisor.	0	Search for project advisor.	0
Week 3	13.10.2024 - 20.10.2024	Search for project advisor.	0	Search for project advisor.	0
Week 4	21.10.2024 - 27.10.2024	Prepare PAF and research for building Android Common Kernel.	8	Search for "Android Kernel Overview".	8
Week 5	28.10.2024 - 03.11.2024	Research for building Generic Kernel Image (GKI).	9	Search for "Android Security Implementation".	8
Week 6	04.11.2024 - 10.11.2024	Prepared for presentation and meeting at General Mobile.	10	Prepared for presentation and meeting at General Mobile.	10
Week 7	11.11.2024 - 17.11.2024	Technical meetings conducted with GM and Repel.	36	Technical meetings conducted with GM and Repel.	36
Week 8	18.11.2024 - 24.11.2024	Design and develop API controllers.	6	Search for SMS protocol, OTP messages and Android Key Store.	10
Week 9	25.11.2024 - 01.12.2024	Research for new cryptograph algorithms as advised.	20	Implement texting functionality with SMS protocol to mobile app.	20
Week 10	02.12.2024 - 08.12.2024	Designed Login and Register screens' UI design.	6	Designed Dashboard and Texting Screens' UI.	8
Week 11	09.12.2024 - 15.12.2024	Develop new login and register screens.	6	Develop designed screens for mobile application.	9
Week 12	16.12.2024 - 22.12.2024	Integrated API and improved UI design.	8	Design encryption functions for mobile app.	12
Week 13	23.12.2024 - 29.12.2024	Implemented encryption functionalities for mobile app.	10	Implement encryption functions to mobile application.	10
Week 14	30.12.2024 - 05.01.2025	Defined testing designs and class structures.	6	Define software system designs for DSD file.	10
Week 15	06.12.2025 - 12.01.2025	Improvements to DSD and RSD files have done.	9	Improvements done to RSD and DSD files.	9
Week 17	13.01.2025 - 19.01.2025	Encryption tests have been conducted.	8	Application and SMS tests are done.	6
Week 18	20.01.2025 - 22.01.2025	Improvements to DSD and RSD files have done.	8	Improvements to DSD and RSD files have done.	8
Total Effort in Man-Hours			150,00		164,00
Total Effort in Man-Days			18,75		20,50

# Consolidated Effort Log

Mert Kahraman		Emir Morah		Total Weekly Effort in Man-Hours
Work Done	Total Hours Spent	Work Done	Total Hours Spent	
Defining project, objectives and team forming.	3	Defining project, objectives and team forming.	3	12,00
Search for project advisor.	5	Search for project advisor.	5	10,00
Search for project advisor.	5	Search for project advisor.	5	10,00
Project Proposal: Introduction and Aim & Objectives parts	7	Project Proposal: User Personas , Expected Outcomes and Happy Paths	8	31,00
Search for "Building custom AOSP versions"	7	Search for "Cross device SDK" of Android OSP	7	31,00
Prepared for presentation and meeting at General Mobile.	10	Prepared for presentation and meeting at General Mobile.	10	40,00
Technical meetings conducted with GM and Repel.	36	Technical meetings conducted with GM and Repel.	36	144,00
Revised project proposal regarding the mentor feedback	6	Revised project proposal regarding the mentor feedback	6	28,00
Complete Introduction and Purpose of the Project headlines of SOW file	8	Complete User Personas, Happy Path and Scope of Work headlines of SOW file	8	56,00
Complete Use-case Point Complexity, Applicable Standards parts of SOW file	8	Completed rest of SOW file: Low Level Functionalities, Special Requirements	8	30,00
Organized GitHub repositories and workflow on Jira	6	Added message controlling endpoints to API.	4	25,00
API endpoints and database logging	8	Designed models and database for API	7	35,00
Planning and redesigning API structure	10	Added authentication endpoints to API	8	38,00
Defined Use-Case and UML diagrams for RSD file	5	Started use case and UML diagrams for RSD file	5	26,00
Continued working on Use-Case and UML diagrams for RSD file	5	Completed use case and UML diagrams for RSD file	5	28,00
Conducted API tests and resolved unexpected behaviors.	5	Conducted API tests and resolved unexpected behaviors.	4	23,00
Improvements to DSD and RSD files have done.	1	Improvements to DSD and RSD files have done.	1	18,00
	122,00		117,00	553,00
	15,25		14,63	69,13



# Conclusions

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The GEMBOS Project has successfully completed the design and planning phases. We have meticulously crafted a comprehensive design and documented all pertinent details.

- In the next steps as COMP 4920 course, we will focus on development and testing to create an effective and user-friendly messaging application.

**End of Presentation**

**Your Questions Please**

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