

Table 4.12. User Functional Requirements: UF-A

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		UF-A				Type	Functional	Non-Functional
Creation:		Sep 22 2025 03:09 PM						
Modification:		Sep 24 2025 03:11 PM				User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
						System	<input type="checkbox"/>	<input type="checkbox"/>
Description:		As a driver, I want to securely create accounts and log in using a username and password so that I can view my driving history.						
Priority:	Highest	High	✓ Medium		Low		Lowest	
This Req. is Refined Into:		SF-A-01						
Justify why UF-A can be completely covered by SF-A-01		To be added later						
Traceability:	Use cases cf.	Yet to be completed in use case worksheet!						
	Test cases cf.	Yet to be completed in test case worksheet!						
Acknowledgment		Generated from the CapStone Process Management System ©2025						

Table 4.13. User Functional Requirements: UF-B

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UF-B				Type	Functional	Non-Functional
Creation:	Sep 22 2025 03:15 PM						
Modification:	Oct 11 2025 05:41 PM				User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	As a driver, I want the system to detect signs of drowsiness in real-time on my face and eyes in order to promote driving safety.						
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Refined Into:		SF-B-01, SF-B-02					
Justify why UF-B can be completely covered by SF-B-01, SF-B-02		To be added later					
Traceability:	Use cases cf.	UC-001, UC-002					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.14. User Functional Requirements: UF-C

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform									
Requirement #:		UF-C				Type		Functional		Non-Functional	
Creation:		Sep 22 2025 03:19 PM									
Modification:		Oct 11 2025 05:41 PM				User		<input checked="" type="checkbox"/>		<input type="checkbox"/>	
						System		<input type="checkbox"/>		<input type="checkbox"/>	
Description:		As a driver, I want the system to continuously monitor my face and eyes in real-time to detect signs of distraction in order to promote driving focus.									
Priority:		Highest		✓ High		Medium		Low		Lowest	
This Req. is Refined Into:			SF-C-01, SF-C-02, SF-C-03								
Justify why UF-C can be completely covered by SF-C-01, SF-C-02, SF-C-03			To be added later								
Traceability:		Use cases cf.		UC-010							
		Test cases cf.		Yet to be completed in test case worksheet!							
Acknowledgment		Generated from the CapStone Process Management System ©2025									

Table 4.15. User Functional Requirements: UF-D

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UF-D				Type	Functional	Non-Functional
Creation:	Sep 22 2025 03:39 PM						
Modification:	Sep 22 2025 03:40 PM				User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	As a driver, I should be able to configure settings, such as volume of alerts or sensitivity of detection.						
Priority:	Highest	High	Medium	✓ Low		Lowest	
This Req. is Refined Into:		SF-D-01, SF-D-02, SF-D-03					
Justify why UF-D can be completely covered by SF-D-01, SF-D-02, SF-D-03		To be added later					
Traceability:	Use cases cf.	UC-003, UC-004					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.16. User Functional Requirements: UF-E

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		UF-E			Type	Functional	Non-Functional
Creation:		Oct 11 2025 05:31 PM					
Modification:		Oct 11 2025 05:33 PM			User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:		As a driver, I want to start and stop the monitoring session manually so that I can control when the app analyzes my driving behavior.					
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Refined Into:		SF-E-01, SF-E-02					
Justify why UF-E can be completely covered by SF-E-01, SF-E-02		To be added later					
Traceability:	Use cases cf.	UC-001					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.17. User Functional Requirements: UF-F

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UF-F				Type	Functional	Non-Functional
Creation:	Oct 11 2025 05:33 PM						
Modification:	Oct 11 2025 05:34 PM				User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	As a driver, I want to receive real-time visual, audio, or vibration alerts when drowsiness or distraction is detected so that I can regain my attention immediately.						
Priority:	Highest	✓ High	Medium	Low		Lowest	
This Req. is Refined Into:		SF-F-02, SF-F-03					
Justify why UF-F can be completely covered by SF-F-02, SF-F-03		To be added later					
Traceability:	Use cases cf.	UC-003					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.18. User Functional Requirements: UF-G

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		UF-G			Type	Functional	Non-Functional
Creation:		Oct 11 2025 05:35 PM					
Modification:	Oct 11 2025 05:35 PM			User	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
				System	<input type="checkbox"/>	<input type="checkbox"/>	
Description:	As a driver, I want to acknowledge or snooze an alert to avoid repeated or unnecessary alarms while still staying aware of my condition.						
Priority:	Highest	High	✓ Medium	Low		Lowest	
This Req. is Refined Into:		SF-G-01, SF-G-02					
Justify why UF-G can be completely covered by SF-G-01, SF-G-02		To be added later					
Traceability:	Use cases cf.	UC-003					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.19. User Functional Requirements: UF-H

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UF-H				Type	Functional	Non-Functional
Creation:	Oct 11 2025 05:36 PM						
Modification:	Oct 11 2025 05:36 PM				User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	As a driver, I want to calibrate the camera at the start of monitoring to ensure my face is properly positioned and lighting is sufficient.						
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Refined Into:		SF-H-01, SF-H-02					
Justify why UF-H can be completely covered by SF-H-01, SF-H-02		To be added later					
Traceability:	Use cases cf.	UC-001, UC-005					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.20. User Functional Requirements: UF-I

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UF-I				Type	Functional	Non-Functional
Creation:	Oct 11 2025 05:36 PM						
Modification:	Oct 11 2025 05:37 PM				User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	As a driver, I want to view or export a summary of my recent alerts or sessions to understand my drowsiness and distraction patterns.						
Priority:	Highest	High	Medium	✓ Low		Lowest	
This Req. is Refined Into:		SF-I-01, SF-I-02					
Justify why UF-I can be completely covered by SF-I-01, SF-I-02		To be added later					
Traceability:	Use cases cf.	UC-003, UC-006, UC-007					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.21. User Functional Requirements: UF-J

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UF-J				Type	Functional	Non-Functional
Creation:	Oct 11 2025 05:37 PM						
Modification:	Oct 11 2025 05:38 PM				User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	As a driver, I want assurance that my camera and data stays on my device so that my privacy is protected.						
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Refined Into:		SF-J-01, SF-J-02, SF-J-03					
Justify why UF-J can be completely covered by SF-J-01, SF-J-02, SF-J-03		To be added later					
Traceability:	Use cases cf.	UC-003, UC-007					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.22. User Functional Requirements: UF-K

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	UF-K			Type	Functional	Non-Functional
Creation:	Oct 11 2025 05:38 PM					
Modification:	Oct 11 2025 05:39 PM			User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	As a system administrator, I want to deploy and configure the apps across multiple devices using managed Android tools so that updates are consistent and secure.					
Priority:	Highest	✓ High	Medium	Low		Lowest
This Req. is Refined Into:		SF-K-01, SF-K-02				
Justify why UF-K can be completely covered by SF-K-01, SF-K-02		To be added later				
Traceability:	Use cases cf.	UC-008				
	Test cases cf.	Yet to be completed in test case worksheet!				
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Table 4.23. User Functional Requirements: UF-L

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	UF-L			Type	Functional	Non-Functional
Creation:	Oct 11 2025 05:39 PM					
Modification:	Oct 11 2025 05:39 PM			User	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	As a fleet manager, I want to view aggregated drowsiness and distraction statistics across drivers so that i can identify safety trends.					
Priority:	Highest	High	Medium	✓ Low		Lowest
This Req. is Refined Into:		SF-L-01, SF-L-02, SF-L-03				
Justify why UF-L can be completely covered by SF-L-01, SF-L-02, SF-L-03		To be added later				
Traceability:	Use cases cf.	UC-009				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.24. User NonFunctional Requirements: UP-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		UP-01			Type	Functional	Non-Functional
Creation:		Oct 11 2025 06:31 PM					
Modification:		Oct 11 2025 06:32 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:		The app shall present an intuitive, minimal interface that requires no more than two user actions to begin monitoring.			Product (sub-type below)		
					Usability Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest	
This Req. is Refined Into:		SP-01-01					
Justify why UP-01 can be completely covered by SP-01-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.25. User NonFunctional Requirements: UP-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	UP-02			Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:32 PM					
Modification:	Oct 11 2025 06:32 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	During active monitoring, no manual interaction shall be required.			Product (sub-type below)		
				Usability Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest
This Req. is Refined Into:		SP-02-01				
Justify why UP-02 can be completely covered by SP-02-01		To be added later				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.26. User NonFunctional Requirements: UP-03

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	UP-03			Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:32 PM					
Modification:	Oct 11 2025 06:33 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	Visual, audio and vibration alerts shall be easily distinguishable and convey meaning without confusing or startling the driver.			Product (sub-type below)		
				Usability Requirements		
Priority:	Highest	High	Medium	✓ Low		Lowest
This Req. is Refined Into:		SP-03-01				
Justify why UP-03 can be completely covered by SP-03-01		To be added later				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
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Table 4.27. User NonFunctional Requirements: UP-04

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	UP-04			Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:33 PM					
Modification:	Oct 11 2025 06:34 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	Interface text size, contrast, and color schemes shall conform to WCAG 2.1 AA accessibility guidelines where feasible on Android			Product (sub-type below)		
				Usability Requirements		
Priority:	Highest	High	Medium	✓ Low		Lowest
This Req. is Refined Into:		SP-04-01				
Justify why UP-04 can be completely covered by SP-04-01		To be added later				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.28. User NonFunctional Requirements: UP-05

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform									
Requirement #:		UP-05				Type		Functional		Non-Functional	
Creation:		Oct 11 2025 06:34 PM									
Modification:		Oct 11 2025 06:35 PM				User		<input type="checkbox"/>		<input checked="" type="checkbox"/>	
						System		<input type="checkbox"/>		<input type="checkbox"/>	
Description:		The system shall maintain at least 15 FPS processing speed and alert latency less than or equal to 200 ms from detection to notification.				Product (sub-type below)					
						Performance Requirements					
Priority:		Highest		✓ High		Medium		Low		Lowest	
This Req. is Refined Into:				SP-05-01, SP-05-02							
Justify why UP-05 can be completely covered by SP-05-01, SP-05-02				To be added later							
Traceability:		Use cases cf.		N/A							
		Test cases cf.		Yet to be completed in test case worksheet!							
Acknowledgment		Generated from the CapStone Process Management System ©2025									

Table 4.29. User NonFunctional Requirements: UP-06

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UP-06				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:35 PM						
Modification:	Oct 11 2025 06:36 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	Model inference shall execute locally using Snapdragon CPU/GPU/NPU resources while keeping sustained CPU utilization under 40 percent				Product (sub-type below)		
					Performance Requirements		
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Refined Into:		SP-06-01					
Justify why UP-06 can be completely covered by SP-06-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.30. User NonFunctional Requirements: UP-07

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UP-07				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:36 PM						
Modification:	Oct 11 2025 06:37 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	The app shall automatically reduce inference frequency if device temperature or battery drain exceeds safe thresholds.				Product (sub-type below)		
					Performance Requirements		
Priority:	Highest	High	Medium	✓ Low		Lowest	
This Req. is Refined Into:		SP-07-01					
Justify why UP-07 can be completely covered by SP-07-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.31. User NonFunctional Requirements: UP-08

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UP-08				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:38 PM						
Modification:	Oct 11 2025 06:39 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	The app shall operate continuously for sessions up to two hours without crash, freeze or data loss				Product (sub-type below)		
					Availability/Reliability/Security		
Priority:	Highest	✓ High	Medium	Low		Lowest	
This Req. is Refined Into:		SP-08-01					
Justify why UP-08 can be completely covered by SP-08-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.32. User NonFunctional Requirements: UP-09

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UP-09				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:39 PM						
Modification:	Oct 11 2025 06:39 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	Upon hardware or model failure, the system shall suspend monitoring and inform the user rather than issue false alerts.				Product (sub-type below)		
					Availability/Reliability/Security		
Priority:	Highest	High	Medium	✓ Low		Lowest	
This Req. is Refined Into:		SP-09-01					
Justify why UP-09 can be completely covered by SP-09-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.33. User NonFunctional Requirements: UP-10

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UP-10				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:39 PM						
Modification:	Oct 11 2025 06:40 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	All captured data shall remain in app-scoped storage, no external transmission occurs unless explicitly authorized				Product (sub-type below)		
					Availability/Reliability/Security		
Priority:	Highest	<input checked="" type="checkbox"/> High	Medium	Low		Lowest	
This Req. is Refined Into:		SP-10-01					
Justify why UP-10 can be completely covered by SP-10-01		To be added later.					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.34. User NonFunctional Requirements: UP-11

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UP-11				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:40 PM						
Modification:	Oct 11 2025 06:41 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall request only essential Android permissions (Camera, Audio, Vibration, Storage) and respect user revocation at runtime.				Product (sub-type below)		
					Availability/Reliability/Security		
Priority:	Highest	High	✓ Medium	Low		Lowest	
This Req. is Refined Into:		SP-11-01					
Justify why UP-11 can be completely covered by SP-11-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.35. User NonFunctional Requirements: UO-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UO-01				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:41 PM						
Modification:	Oct 11 2025 06:42 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	The app shall be developed in Android Studio (Kotlin) and tested on Snapdragon-based devices to validate hardware acceleration.				Organizational (sub-type below)		
					Development Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest	
This Req. is Refined Into:		SO-01-01, SO-01-02					
Justify why UO-01 can be completely covered by SO-01-01, SO-01-02		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.36. User NonFunctional Requirements: UO-02

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		UO-02			Type	Functional	Non-Functional
Creation:		Oct 11 2025 06:42 PM					
Modification:		Oct 11 2025 06:43 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:		All source code shall reside in a Git Repository with branching and commit standards documented in the project README.			Organizational (sub-type below)		
					Development Requirements		
Priority:		Highest	High	Medium	✓ Low		Lowest
This Req. is Refined Into:			SO-02-01, SO-02-02				
Justify why UO-02 can be completely covered by SO-02-01, SO-02-02			To be added later				
Traceability:		Use cases cf.		N/A			
		Test cases cf.		Yet to be completed in test case worksheet!			
Acknowledgment		Generated from the CapStone Process Management System ©2025					

Table 4.37. User NonFunctional Requirements: UO-03

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	UO-03			Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:43 PM					
Modification:	Oct 11 2025 06:44 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	Code shall follow Kotlin style conventions, include inline comments, and undergo peer review for clarity and maintainability.			Organizational (sub-type below)		
				Development Requirements		
Priority:	Highest	High	Medium	✓ Low		Lowest
This Req. is Refined Into:		SO-03-01, SO-03-02, SO-03-03				
Justify why UO-03 can be completely covered by SO-03-01, SO-03-02, SO-03-03		To be added later				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.38. User NonFunctional Requirements: UO-04

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UO-04				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:44 PM						
Modification:	Oct 11 2025 06:44 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	Each functional requirement shall be verified by at least one unit or integration test before milestone release.				Organizational (sub-type below)		
					Development Requirements		
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Refined Into:		SO-04-01					
Justify why UO-04 can be completely covered by SO-04-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.39. User NonFunctional Requirements: UO-05

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UO-05				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:44 PM						
Modification:	Oct 11 2025 06:45 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	The app shall be packaged as an APK targeting Android Level 33 or higher and installable without device root access.				Organizational (sub-type below)		
					Operational Requirements		
Priority:	Highest	High	Medium	✓ Low		Lowest	
This Req. is Refined Into:		SO-05-01					
Justify why UO-05 can be completely covered by SO-05-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.40. User NonFunctional Requirements: UO-06

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform									
Requirement #:		UO-06				Type		Functional		Non-Functional	
Creation:		Oct 11 2025 06:45 PM									
Modification:		Oct 11 2025 06:46 PM				User		<input type="checkbox"/>		<input checked="" type="checkbox"/>	
						System		<input type="checkbox"/>		<input type="checkbox"/>	
Description:		A concise user guide or in app section shall describe calibration, settings, and safety disclaimers.				Organizational (sub-type below)					
						Operational Requirements					
Priority:		Highest		✓ High		Medium		Low		Lowest	
This Req. is Refined Into:			SO-06-01, SO-06-02, SO-06-03								
Justify why UO-06 can be completely covered by SO-06-01, SO-06-02, SO-06-03			To be added later								
Traceability:		Use cases cf.		N/A							
		Test cases cf.		Yet to be completed in test case worksheet!							
Acknowledgment		Generated from the CapStone Process Management System ©2025									

Table 4.41. User NonFunctional Requirements: UO-07

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform									
Requirement #:		UO-07				Type		Functional		Non-Functional	
Creation:		Oct 11 2025 06:47 PM									
Modification:		Oct 11 2025 06:47 PM				User		<input type="checkbox"/>		<input checked="" type="checkbox"/>	
						System		<input type="checkbox"/>		<input type="checkbox"/>	
Description:		The system shall maintain detection accuracy under daylight, artificial, and low-light cabin conditions.				Organizational (sub-type below)					
						Environmental Requirements					
Priority:		Highest		✓ High		Medium		Low		Lowest	
This Req. is Refined Into:			SO-07-01, SO-07-02								
Justify why UO-07 can be completely covered by SO-07-01, SO-07-02			To be added later								
Traceability:		Use cases cf.		N/A							
		Test cases cf.		Yet to be completed in test case worksheet!							
Acknowledgment		Generated from the CapStone Process Management System ©2025									

Table 4.42. User NonFunctional Requirements: UO-08

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		UO-08			Type	Functional	Non-Functional
Creation:		Oct 11 2025 06:47 PM					
Modification:		Oct 11 2025 06:48 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:		The app shall operate correctly when the phone is mounted either in landscape or portrait orientation.			Organizational (sub-type below)		
					Environmental Requirements		
Priority:		Highest	High	Medium	✓ Low		Lowest
This Req. is Refined Into:			SO-08-01				
Justify why UO-08 can be completely covered by SO-08-01			To be added later				
Traceability:		Use cases cf.		N/A			
		Test cases cf.		Yet to be completed in test case worksheet!			
Acknowledgment		Generated from the CapStone Process Management System ©2025					

Table 4.43. User NonFunctional Requirements: UO-09

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		UO-09				Type	Functional	Non-Functional
Creation:		Oct 11 2025 06:48 PM						
Modification:		Oct 11 2025 06:48 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						System	<input type="checkbox"/>	<input type="checkbox"/>
Description:		All detection, alerts, and settings shall operate fully without internet connection.				Organizational (sub-type below)		
						Environmental Requirements		
Priority:		Highest	High	✓ Medium	Low		Lowest	
This Req. is Refined Into:			SO-09-01					
Justify why UO-09 can be completely covered by SO-09-01			To be added later					
Traceability:		Use cases cf.		N/A				
		Test cases cf.		Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025						

Table 4.44. User NonFunctional Requirements: UE-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		UE-01				Type	Functional	Non-Functional
Creation:		Oct 11 2025 06:48 PM						
Modification:		Oct 14 2025 09:33 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						System	<input type="checkbox"/>	<input type="checkbox"/>
Description:		The app shall include a startup safety disclaimer and disable manual interaction prompts while the vehicle is in motion.				External (sub-type below)		
						Legislative Requirements on Safety/Security		
Priority:		Highest	✓ High	Medium	Low		Lowest	
This Req. is Refined Into:			SE-01-01					
Justify why UE-01 can be completely covered by SE-01-01			To be added later					
Traceability:		Use cases cf.	N/A					
		Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment		Generated from the CapStone Process Management System ©2025						

Table 4.45. User NonFunctional Requirements: UE-03

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	UE-03				Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:50 PM						
Modification:	Oct 14 2025 09:29 PM				User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
					System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	The face-detection model shall be evaluated for consistent accuracy across diverse skin tones, facial structures, and eyewear.				External (sub-type below)		
					Cultural and Social Requirements		
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Refined Into:		SE-03-01					
Justify why UE-03 can be completely covered by SE-03-01		To be added later					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.46. User NonFunctional Requirements: UE-04

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform				
Requirement #:		UE-04		Type	Functional	Non-Functional
Creation:		Oct 11 2025 06:50 PM				
Modification:		Oct 11 2025 06:51 PM		User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:		The interface and alert text shall default to English and be structured for easy localization into other languages.			External (sub-type below)	
					Cultural and Social Requirements	
Priority:	Highest	High	Medium	✓ Low		Lowest
This Req. is Refined Into:		SE-04-01				
Justify why UE-04 can be completely covered by SE-04-01		To be added later				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
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Table 4.47. User NonFunctional Requirements: UE-05

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	UE-05			Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:51 PM					
Modification:	Oct 11 2025 06:52 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	The app shall utilize only stable Android Jetpack APIs to ensure device portability.			External (sub-type below)		
				Interoperability Requirements		
Priority:	Highest	High	Medium	✓ Low		Lowest
This Req. is Refined Into:		SE-05-01				
Justify why UE-05 can be completely covered by SE-05-01		To be added later				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
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Table 4.48. User NonFunctional Requirements: UE-06

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform				
Requirement #:	UE-06			Type	Functional	Non-Functional
Creation:	Oct 11 2025 06:52 PM					
Modification:	Oct 11 2025 06:52 PM			User	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				System	<input type="checkbox"/>	<input type="checkbox"/>
Description:	The app shall interoperate seamlessly with both Qualcomm QNN and Android NNAPI runtimes for ML acceleration without requiring code modifications.			External (sub-type below)		
				Interoperability Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest
This Req. is Refined Into:		SE-06-01				
Justify why UE-06 can be completely covered by SE-06-01		To be added later				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
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Table 4.49. System Functional Requirements: SF-A-01

Project Name: Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform							
Requirement #:		SF-A-01			Type	Functional	Non-Functional
Creation:		Sep 22 2025 03:28 PM					
Modification:	Oct 14 2025 09:25 PM			User	<input type="checkbox"/>	<input type="checkbox"/>	
				System	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Description:	The system shall record instances of detected drowsiness or distraction for each trip, including timestamps						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-A					
Justify why meeting SF-A-01 can contribute to the fulfilment of UF-A		Meeting SF-A-01 contributes to UF-A by recording drowsiness or distraction events with timestamps, enabling drivers to view an accurate history of their driving behavior after logging in.					
Traceability:	Use cases cf.	UC-003					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.50. System Functional Requirements: SF-B-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SF-B-01			Type	Functional	Non-Functional
Creation:	Sep 22 2025 03:23 PM					
Modification:	Sep 22 2025 03:25 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall provide immediate audible and visual alerts when drowsiness or distraction is detected.					
Priority:	Highest	✓ High	Medium	Low	Lowest	
This Req. is Engineered From:		UF-B				
Justify why meeting SF-B-01 can contribute to the fulfilment of UF-B		Meeting SF-B-01 fulfills UF-B by detecting drowsiness and immediately alerting the driver with audible and visual cues, directly supporting the goal of promoting driving safety.				
Traceability:	Use cases cf.	UC-001, UC-002, UC-003				
	Test cases cf.	Yet to be completed in test case worksheet!				
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Table 4.51. System Functional Requirements: SF-B-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-B-02				Type	Functional	Non-Functional
Creation:	Sep 22 2025 03:26 PM						
Modification:	Sep 22 2025 03:37 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall detect when the drivers eyes are closed for prolonged periods and trigger alerts.						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-B					
Justify why meeting SF-B-02 can contribute to the fulfilment of UF-B		Meeting SF-B-02 contributes to UF-B by detecting driver inattention and triggering alerts, helping the driver stay focused and supporting the goal of driving safety.					
Traceability:	Use cases cf.	UC-001, UC-002					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.52. System Functional Requirements: SF-C-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		SF-C-01				Type	Functional	Non-Functional
Creation:		Sep 22 2025 03:38 PM						
Modification:		Sep 22 2025 03:39 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
						System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:		The system shall detect when the drivers eyes are looking away from the road for prolonged periods and trigger alerts.						
Priority:		Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:			UF-C					
Justify why meeting SF-C-01 can contribute to the fulfilment of UF-C								
Traceability:		Use cases cf.		UC-001				
		Test cases cf.		Yet to be completed in test case worksheet!				
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Table 4.53. System Functional Requirements: SF-C-02

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform									
Requirement #:		SF-C-02				Type		Functional		Non-Functional	
Creation:		Sep 24 2025 03:01 PM									
Modification:		Oct 31 2025 07:34 PM				User		<input type="checkbox"/>		<input type="checkbox"/>	
						System		<input checked="" type="checkbox"/>		<input type="checkbox"/>	
Description:		The system shall continuously process front-camera frames and estimate head yaw (θ). It shall raise a DISTRACTED event when the absolute yaw angle exceeds a configurable threshold for a sustained, configurable duration.									
Priority:		Highest		<input checked="" type="checkbox"/> High		Medium		Low		Lowest	
This Req. is Engineered From:				UF-C							
Justify why meeting SF-C-02 can contribute to the fulfilment of UF-C				Maps to UF-C because it defines the actual decision rule for distraction (yaw angle + sustained duration) from continuous face monitoring, so the system can detect and flag distraction in real time.							
Traceability:		Use cases cf.		UC-010							
		Test cases cf.		Yet to be completed in test case worksheet!							
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Table 4.54. System Functional Requirements: SF-C-03

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-C-03				Type	Functional	Non-Functional
Creation:	Sep 24 2025 03:10 PM						
Modification:	Oct 31 2025 07:36 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall continuously estimate eye gaze and raise a DISTRACTED event when gaze deviates off the forward road region beyond configurable angular bounds for a sustained, configurable duration.						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-C					
Justify why meeting SF-C-03 can contribute to the fulfilment of UF-C		UF-C asks for real-time monitoring of face and eyes to detect distraction. This SR adds an eye-based detection path (gaze off road), complementing head-yaw, directly fulfilling the “eyes” aspect of UF-C.					
Traceability:	Use cases cf.	Yet to be completed in use case worksheet!					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.55. System Functional Requirements: SF-D-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-D-01				Type	Functional	Non-Functional
Creation:	Sep 24 2025 02:56 PM						
Modification:	Sep 24 2025 02:58 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall provide a settings menu accessible to the driver.						
Priority:	Highest	✓ High	Medium	Low		Lowest	
This Req. is Engineered From:		UF-D					
Justify why meeting SF-D-01 can contribute to the fulfilment of UF-D		Meeting SF-D-01 directly contributes to fulfilling UF-D because it ensures that the system includes the technical capability for a settings menu that the driver can access.					
Traceability:	Use cases cf.	UC-003, UC-004					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.56. System Functional Requirements: SF-D-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SF-D-02			Type	Functional	Non-Functional
Creation:	Sep 24 2025 02:58 PM					
Modification:	Sep 24 2025 02:59 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall allow the driver to adjust the volume of alerts.					
Priority:	Highest	High	Medium	Low	Lowest	
This Req. is Engineered From:		UF-D				
Justify why meeting SF-D-02 can contribute to the fulfilment of UF-D		Meeting SF-D-02 fulfills UF-D by providing the mechanism for the driver to adjust alert volume. It ensures the system can change audio output levels based on user input, satisfying the requirement for configurable alerts and allowing verification through functional testing				
Traceability:	Use cases cf.	UC-004				
	Test cases cf.	Yet to be completed in test case worksheet!				
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Table 4.57. System Functional Requirements: SF-D-03

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-D-03				Type	Functional	Non-Functional
Creation:	Sep 24 2025 02:59 PM						
Modification:	Sep 24 2025 03:01 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall allow the driver to adjust the sensitivity level of detection.						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-D					
Justify why meeting SF-D-03 can contribute to the fulfilment of UF-D		Meeting SF-D-03 fulfills UF-D by enabling the driver to adjust the system’s detection sensitivity. It provides the functionality needed to change detection thresholds, ensuring the system responds appropriately to driver preferences and can be verified through functional testing.					
Traceability:	Use cases cf.	UC-004					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.58. System Functional Requirements: SF-E-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		SF-E-01				<div>TypeFunctionalNon-Functional</div>	
Creation:		Oct 31 2025 07:37 PM					
Modification:		Oct 31 2025 07:38 PM				User <div><input type="checkbox"/></div>	
						System <div><input checked="" type="checkbox"/></div> <div><input type="checkbox"/></div>	
Description:		The system shall provide explicit controls to Start and Stop a monitoring session. On Start, it shall request camera permission if needed, initialize CameraX and on-device inference, and begin emitting detection events. On Stop, it shall tear down camera/inference and finalize the current session.					
Priority:		Highest	<div>✓ High</div>	Medium	Low	Lowest	
This Req. is Engineered From:			UF-E				
Justify why meeting SF-E-01 can contribute to the fulfilment of UF-E			implements the user’s explicit control over when monitoring starts/stops.				
Traceability:		Use cases cf.		Yet to be completed in use case worksheet!			
		Test cases cf.		Yet to be completed in test case worksheet!			
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Table 4.59. System Functional Requirements: SF-E-02

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform									
Requirement #:		SF-E-02		Type		Functional		Non-Functional			
Creation:		Oct 31 2025 07:39 PM									
Modification:		Oct 31 2025 07:41 PM		User		<input type="checkbox"/>		<input type="checkbox"/>			
				System		<input checked="" type="checkbox"/>		<input type="checkbox"/>			
Description:		When the driver taps Start, the system shall execute a preflight flow that (a) verifies/requests camera permission, (b) verifies camera availability, and (c) initializes the monitoring pipeline only if all checks pass; otherwise it shall surface a clear, actionable error and remain stopped.									
Priority:		Highest		✓ High		Medium		Low		Lowest	
This Req. is Engineered From:		UF-E									
Justify why meeting SF-E-02 can contribute to the fulfilment of UF-E		UF-E is about driver control over when monitoring occurs. This SR guarantees monitoring never begins or resumes without an explicit Start, and that Stop truly ends analysis—preserving the user’s manual control exactly as requested.									
Traceability:		Use cases cf.		Yet to be completed in use case worksheet!							

	Test cases cf.	Yet to be completed in test case worksheet!
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Table 4.60. System Functional Requirements: SF-F-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SF-F-02			Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:42 PM					
Modification:	Oct 31 2025 07:42 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	When the system detects DROWSY or DISTRACTED, it shall emit an alert in ≤ 200 ms from the detection event, updating the UI banner and triggering device audio/vibration per current settings					
Priority:	Highest	High	Medium	Low		Lowest
This Req. is Engineered From:		UF-F				
Justify why meeting SF-F-02 can contribute to the fulfilment of UF-F		UF-F requires immediate alerts to regain attention; this SR guarantees timely delivery of the alert.				
Traceability:	Use cases cf.	UC-010				
	Test cases cf.	Yet to be completed in test case worksheet!				
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Table 4.61. System Functional Requirements: SF-F-03

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		SF-F-03				Type	Functional	Non-Functional
Creation:		Oct 31 2025 07:42 PM						
Modification:		Oct 31 2025 07:43 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
						System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:		The system shall select active alert modalities (visual, audio, vibration) based on user settings and device capability/state (ringer mode, DND, vibrator present). If a modality is unavailable, it shall fallback to available ones and always present a visual alert.						
Priority:		Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:			UF-F					
Justify why meeting SF-F-03 can contribute to the fulfilment of UF-F			UF-F asks for visual/audio/vibration; this SR ensures the right mix is used reliably, with fallbacks so the driver still gets alerted.					
Traceability:		Use cases cf.	Yet to be completed in use case worksheet!					
		Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment		Generated from the CapStone Process Management System ©2025						

Table 4.62. System Functional Requirements: SF-G-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-G-01				Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:44 PM						
Modification:	Oct 31 2025 07:44 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	When the driver taps Acknowledge, the system shall immediately dismiss the current alert (visual/audio/vibration), stop any ongoing alert output, and continue monitoring.						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-G					
Justify why meeting SF-G-01 can contribute to the fulfilment of UF-G		Gives the driver control to stop a specific alert without disabling monitoring—reduces unnecessary alarms while staying aware.					
Traceability:	Use cases cf.	Yet to be completed in use case worksheet!					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.63. System Functional Requirements: SF-G-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-G-02				Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:44 PM						
Modification:	Oct 31 2025 07:45 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	When the driver taps Snooze, the system shall suppress alerts of the same type for a configurable cooldown while monitoring continues.						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-G					
Justify why meeting SF-G-02 can contribute to the fulfilment of UF-G		Prevents repeated alarms for the same condition, matching the user’s goal while keeping them aware of ongoing monitoring.					
Traceability:	Use cases cf.	Yet to be completed in use case worksheet!					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.64. System Functional Requirements: SF-H-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform				
Requirement #:		SF-H-01		Type	Functional	Non-Functional
Creation:		Oct 31 2025 07:45 PM				
Modification:	Oct 31 2025 07:46 PM		User	<input type="checkbox"/>	<input type="checkbox"/>	
			System	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Description:	Before monitoring starts, the system shall present a Calibration flow and block Start until calibration passes or the user explicitly skips. If skipped or failed, the session starts in degraded mode (lower alert confidence) and shows an inline tip.					
Priority:	Highest	✓ High	Medium	Low	Lowest	
This Req. is Engineered From:		UF-H				
Justify why meeting SF-H-01 can contribute to the fulfilment of UF-H		Ensures calibration happens at the start and explicitly controls entry to monitoring, matching the user’s intent.				
Traceability:	Use cases cf.	UC-005				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025				

Table 4.65. System Functional Requirements: SF-H-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-H-02				Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:46 PM						
Modification:	Oct 31 2025 07:46 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	During calibration, the system shall show live guidance overlays (face box, eye markers) and evaluate position and pose stability until pass criteria are met.						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-H					
Justify why meeting SF-H-02 can contribute to the fulfilment of UF-H		Directly targets “properly positioned” face via measurable alignment and stability rules.					
Traceability:	Use cases cf.	UC-005					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.66. System Functional Requirements: SF-I-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		SF-I-01			Type	Functional	Non-Functional
Creation:		Oct 31 2025 07:47 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
Modification:		Oct 31 2025 07:48 PM			System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:		The system shall provide a Summary screen that displays, for a chosen time range or session: total alerts by type (Drowsy, Distracted), timestamps, session duration, and average PERCLOS; users can filter by Last Session, Today, 7 Days, or Custom Range.					
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-I					
Justify why meeting SF-I-01 can contribute to the fulfilment of UF-I		Presents an at-a-glance view of recent alerts/sessions so drivers can understand patterns.					
Traceability:	Use cases cf.	UC-006					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.67. System Functional Requirements: SF-I-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-I-02				Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:48 PM						
Modification:	Oct 31 2025 07:48 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall persist per-session records locally and expose a query API to retrieve summaries for time windows.						
Priority:	Highest	✓ High	Medium	Low		Lowest	
This Req. is Engineered From:		UF-I					
Justify why meeting SF-I-02 can contribute to the fulfilment of UF-I		Enables the summaries the user wants by reliably capturing and retrieving session/alert data.					
Traceability:	Use cases cf.	UC-006					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.68. System Functional Requirements: SF-J-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-J-01				Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:49 PM						
Modification:	Oct 31 2025 07:49 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall perform all camera capture and ML inference on device and shall not transmit frames, embeddings, or detection results to any network endpoint.						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-J					
Justify why meeting SF-J-01 can contribute to the fulfilment of UF-J		Ensures camera data never leaves the device, directly satisfying the privacy request.					
Traceability:	Use cases cf.	Yet to be completed in use case worksheet!					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.69. System Functional Requirements: SF-J-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-J-02				Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:50 PM						
Modification:	Oct 31 2025 07:50 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall store only session metadata and alert events in app-scoped storage; by default, it shall not persist raw images or video frames.						
Priority:	Highest	High	✓ Medium	Low		Lowest	
This Req. is Engineered From:		UF-J					
Justify why meeting SF-J-02 can contribute to the fulfilment of UF-J		Minimizes what’s kept and keeps it local, reducing privacy risk.					
Traceability:	Use cases cf.	Yet to be completed in use case worksheet!					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.70. System Functional Requirements: SF-J-03

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform				
Requirement #:		SF-J-03		Type	Functional	Non-Functional
Creation:		Oct 31 2025 07:50 PM				
Modification:	Oct 31 2025 07:51 PM		User	<input type="checkbox"/>	<input type="checkbox"/>	
			System	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Description:	The system shall request only the minimum runtime permissions required (e.g., CAMERA) and shall block any background network requests originating from the monitoring module.					
Priority:	Highest	✓ High	Medium	Low	Lowest	
This Req. is Engineered From:		UF-J				
Justify why meeting SF-J-03 can contribute to the fulfilment of UF-J		Limits privileges and prevents unintended data transmission, protecting privacy as requested.				
Traceability:	Use cases cf.	UC-007				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025				

Table 4.71. System Functional Requirements: SF-K-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-K-01				Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:51 PM						
Modification:	Oct 31 2025 07:52 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The system shall support MDM-driven install/update with staged rollout (e.g., 5% → 25% → 100%), version pinning, and force-install on enrolled devices.						
Priority:	Highest	✓ High	Medium	Low		Lowest	
This Req. is Engineered From:		UF-K					
Justify why meeting SF-K-01 can contribute to the fulfilment of UF-K		Enables consistent, secure rollout of app updates across many devices.					
Traceability:	Use cases cf.	UC-008					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.72. System Functional Requirements: SF-K-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SF-K-02			Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:52 PM					
Modification:	Oct 31 2025 07:53 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	When allowed by MDM, the app shall honor policy to auto-grant CAMERA permission at install/update and halt monitoring if policy later revokes it, showing an admin-configured message.					
Priority:	Highest	High	✓ Medium	Low		Lowest
This Req. is Engineered From:		UF-K				
Justify why meeting SF-K-02 can contribute to the fulfilment of UF-K		Centralizes permission handling for consistent, secure setup.				
Traceability:	Use cases cf.	UC-008				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.73. System Functional Requirements: SF-L-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SF-L-01			Type	Functional	Non-Functional
Creation:	Oct 31 2025 07:59 PM					
Modification:	Oct 31 2025 07:59 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description:	The backend shall compute fleet-level KPIs over a selected time window: alerts per driving hour, counts by type (Drowsy/Distracted), sessions with ≥1 alert (%), and time-of-day/day-of-week distributions.					
Priority:	Highest	High	✓ Medium	Low		Lowest
This Req. is Engineered From:		UF-L				
Justify why meeting SF-L-01 can contribute to the fulfilment of UF-L		Provides the aggregated statistics needed to see safety trends across drivers.				
Traceability:	Use cases cf.	UC-009				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.74. System Functional Requirements: SF-L-02

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		SF-L-02			<div>Type</div>	<div>Functional</div>	<div>Non-Functional</div>
Creation:		Oct 31 2025 08:00 PM					
Modification:	Oct 31 2025 08:00 PM						
		User	<input type="checkbox"/>	<input type="checkbox"/>			
		System	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
Description:	The system shall accept anonymized session summaries via an ingestion API or bulk import						
Priority:	Highest	<input checked="" type="checkbox"/> High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-L					
Justify why meeting SF-L-02 can contribute to the fulfilment of UF-L		Reliable, clean data is essential to build accurate aggregates for trend analysis.					
Traceability:	Use cases cf.	UC-009					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment		Generated from the CapStone Process Management System ©2025					

Table 4.75. System Functional Requirements: SF-L-03

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SF-L-03				Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:00 PM						
Modification:	Oct 31 2025 08:00 PM						
Description:	The analytics service shall support filtering KPIs by organization, driver cohort/vehicle group, device model/app version, and date range.						
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UF-L					
Justify why meeting SF-L-03 can contribute to the fulfilment of UF-L		Lets fleet managers slice the aggregates to find where/when safety risks cluster.					
Traceability:	Use cases cf.	UC-009					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.76. System NonFunctional Requirements: SP-01-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform														
Requirement #:		SP-01-01				<table><tr><td>Type</td><td>Functional</td><td>Non-Functional</td></tr><tr><td>User</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr><tr><td>System</td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr></table>		Type	Functional	Non-Functional	User	<input type="checkbox"/>	<input type="checkbox"/>	System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Type	Functional	Non-Functional														
User	<input type="checkbox"/>	<input type="checkbox"/>														
System	<input type="checkbox"/>	<input checked="" type="checkbox"/>														
Creation:		Oct 30 2025 09:24 PM														
Modification:		Oct 30 2025 09:25 PM														
Description:		The system UI shall launch within 2 seconds and maintain a response time < 200 ms for all on-screen interactions.				Product (sub-type below)										
						Usability Requirements										
Priority:	Highest	High	✓ Medium	Low		Lowest										
This Req. is Engineered From:		UP-01														
Justify why meeting SP-01-01 can contribute to the fulfilment of UP-01																
Traceability:	Use cases cf.	N/A														
	Test cases cf.	Yet to be completed in test case worksheet!														
Acknowledgment		Generated from the CapStone Process Management System ©2025														

Table 4.77. System NonFunctional Requirements: SP-02-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SP-02-01				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:25 PM						
Modification:	Oct 30 2025 09:27 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The system shall automatically start monitoring when the driver presses “Start Session,” requiring no further manual input.				Product (sub-type below)		
					Usability Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest	
This Req. is Engineered From:		UP-02					
Justify why meeting SP-02-01 can contribute to the fulfilment of UP-02							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.78. System NonFunctional Requirements: SP-03-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SP-03-01				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:26 PM						
Modification:	Oct 30 2025 09:27 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The alert subsystem shall generate visual, audio, and haptic feedback signals that are synchronized within ± 50 ms.				Product (sub-type below)		
					Usability Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest	
This Req. is Engineered From:		UP-03					
Justify why meeting SP-03-01 can contribute to the fulfilment of UP-03							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.79. System NonFunctional Requirements: SP-04-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SP-04-01			Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:26 PM					
Modification:	Oct 30 2025 09:27 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	All UI text and contrast ratios shall conform to WCAG 2.1 AA standards for accessibility.			Product (sub-type below)		
				Usability Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest
This Req. is Engineered From:		UP-04				
Justify why meeting SP-04-01 can contribute to the fulfilment of UP-04						
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.80. System NonFunctional Requirements: SP-05-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform				
Requirement #:		SP-05-01		Type	Functional	Non-Functional
Creation:		Oct 30 2025 09:27 PM				
Modification:	Oct 30 2025 09:27 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The inference module shall process ≥ 15 frames per second and issue alerts within 200 ms of detection.			Product (sub-type below)		
				Performance Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest
This Req. is Engineered From:		UP-05				
Justify why meeting SP-05-01 can contribute to the fulfilment of UP-05						
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025				

Table 4.81. System NonFunctional Requirements: SP-05-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SP-05-02			Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:28 PM					
Modification:	Oct 30 2025 09:28 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	During continuous operation, average CPU utilization shall not exceed 40 %, and thermal throttling shall be avoided through adaptive frame skipping.			Product (sub-type below)		
				Performance Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest
This Req. is Engineered From:		UP-05				
Justify why meeting SP-05-02 can contribute to the fulfilment of UP-05						
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.82. System NonFunctional Requirements: SP-06-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		SP-06-01			Type	Functional	Non-Functional
Creation:		Oct 31 2025 08:19 PM					
Modification:		Oct 31 2025 08:19 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:		Inference must execute locally using Snapdragon CPU/GPU/NPU via QNN/NNAPI, with preferred NPU then GPU, falling back to CPU only if required.			Product (sub-type below)		
					Performance Requirements		
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Engineered From:		UP-06					
Justify why meeting SP-06-01 can contribute to the fulfilment of UP-06		Ensures inference stays on device and leverages Snapdragon accelerators.					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment		Generated from the CapStone Process Management System ©2025					

Table 4.83. System NonFunctional Requirements: SP-07-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform														
Requirement #:		SP-07-01				<table><tr><td>Type</td><td>Functional</td><td>Non-Functional</td></tr><tr><td>User</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr><tr><td>System</td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr></table>		Type	Functional	Non-Functional	User	<input type="checkbox"/>	<input type="checkbox"/>	System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Type	Functional	Non-Functional														
User	<input type="checkbox"/>	<input type="checkbox"/>														
System	<input type="checkbox"/>	<input checked="" type="checkbox"/>														
Creation:		Oct 31 2025 08:20 PM														
Modification:		Oct 31 2025 08:21 PM														
Description:		When device temperature or battery drain exceeds safe thresholds, the app shall automatically reduce inference frequency (FPS) and/or input resolution to lower load.				Product (sub-type below)										
						Performance Requirements										
Priority:	Highest	✓ High	Medium	Low	Lowest											
This Req. is Engineered From:		UP-07														
Justify why meeting SP-07-01 can contribute to the fulfilment of UP-07		Directly implements UP-07’s requirement to automatically reduce inference frequency under unsafe thermal/battery conditions.														
Traceability:	Use cases cf.	N/A														
	Test cases cf.	Yet to be completed in test case worksheet!														
Acknowledgment		Generated from the CapStone Process Management System ©2025														

Table 4.84. System NonFunctional Requirements: SP-08-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SP-08-01				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:28 PM						
Modification:	Oct 30 2025 09:28 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The monitoring process shall run stably for at least 2 hours without crash, memory leak, or data loss.				Product (sub-type below)		
					Availability/Reliability/Security		
Priority:	Highest	<input checked="" type="checkbox"/> High	Medium	Low	Lowest		
This Req. is Engineered From:		UP-08					
Justify why meeting SP-08-01 can contribute to the fulfilment of UP-08							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.85. System NonFunctional Requirements: SP-09-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SP-09-01			Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:28 PM					
Modification:	Oct 30 2025 09:29 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	On hardware or model failure, the system shall halt inference and display a “Safe Mode” warning.			Product (sub-type below)		
				Availability/Reliability/Security		
Priority:	Highest	High	Medium	✓ Low		Lowest
This Req. is Engineered From:		UP-09				
Justify why meeting SP-09-01 can contribute to the fulfilment of UP-09						
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.86. System NonFunctional Requirements: SP-10-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		SP-10-01				Type	Functional	Non-Functional
Creation:		Oct 30 2025 09:29 PM						
Modification:		Oct 30 2025 09:29 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
						System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:		All data logs and configuration files shall be stored in app-scoped encrypted storage and deleted upon user request.				Product (sub-type below)		
						Availability/Reliability/Security		
Priority:		Highest	High	Medium	Low		Lowest	
This Req. is Engineered From:			UP-10					
Justify why meeting SP-10-01 can contribute to the fulfilment of UP-10								
Traceability:		Use cases cf.		N/A				
		Test cases cf.		Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025						

Table 4.87. System NonFunctional Requirements: SP-11-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		SP-11-01			Type	Functional	Non-Functional
Creation:		Oct 30 2025 09:29 PM					
Modification:		Oct 30 2025 09:30 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:		The application shall respect Android runtime permission revocations and immediately disable camera or microphone access.			Product (sub-type below)		
					Availability/Reliability/Security		
Priority:		Highest	✓ High	Medium	Low	Lowest	
This Req. is Engineered From:			UP-11				
Justify why meeting SP-11-01 can contribute to the fulfilment of UP-11							
Traceability:		Use cases cf.	N/A				
		Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025					

Table 4.88. System NonFunctional Requirements: SO-01-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		SO-01-01				Type	Functional	Non-Functional
Creation:		Oct 30 2025 09:30 PM						
Modification:		Oct 30 2025 09:30 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
						System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:		Development shall use Android Studio Giraffe + Kotlin 1.9 with Git version control.				Organizational (sub-type below)		
						Development Requirements		
Priority:		Highest	<input checked="" type="checkbox"/> High	Medium	Low		Lowest	
This Req. is Engineered From:			UO-01					
Justify why meeting SO-01-01 can contribute to the fulfilment of UO-01								
Traceability:		Use cases cf.		N/A				
		Test cases cf.		Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025						

Table 4.89. System NonFunctional Requirements: SO-01-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SO-01-02			Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:03 PM					
Modification:	Oct 31 2025 08:04 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The codebase shall live in a single authoritative Git repository with protected branches.			Organizational (sub-type below)		
				Development Requirements		
Priority:	Highest	<input checked="" type="checkbox"/> High	Medium	Low		Lowest
This Req. is Engineered From:		UO-01				
Justify why meeting SO-01-02 can contribute to the fulfilment of UO-01		Ensures the “all source code in Git” mandate is enforceable and safe.				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.90. System NonFunctional Requirements: SO-02-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-02-01				Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:04 PM						
Modification:	Oct 31 2025 08:04 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	CI shall block merges that violate documented branching and commit standards.				Organizational (sub-type below)		
					Development Requirements		
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Engineered From:		UO-02					
Justify why meeting SO-02-01 can contribute to the fulfilment of UO-02		Turns README standards into enforceable gates, not suggestions.					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.91. System NonFunctional Requirements: SO-02-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SO-02-02			Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:05 PM					
Modification:	Oct 31 2025 08:06 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The repository shall include a README section detailing branching/commit rules and a PR template; CI validates their presence and version.			Organizational (sub-type below)		
				Development Requirements		
Priority:	Highest	High	Medium	✓ Low		Lowest
This Req. is Engineered From:		UO-02				
Justify why meeting SO-02-02 can contribute to the fulfilment of UO-02		Keeps the documented standards up-to-date and visible at the point of contribution.				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.92. System NonFunctional Requirements: SO-03-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-03-01				Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:11 PM						
Modification:	Oct 31 2025 08:11 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	Enforce Kotlin style via automated linters in CI.				Organizational (sub-type below)		
					Development Requirements		
Priority:	Highest	<input checked="" type="checkbox"/> High	Medium	Low	Lowest		
This Req. is Engineered From:		UO-03					
Justify why meeting SO-03-01 can contribute to the fulfilment of UO-03		Turns the “follow Kotlin conventions” part of UO-03 into an enforceable gate.					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.93. System NonFunctional Requirements: SO-03-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-03-02				Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:12 PM						
Modification:	Oct 31 2025 08:12 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	Require API docs and meaningful inline comments for non-obvious logic.				Organizational (sub-type below)		
					Development Requirements		
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UO-03					
Justify why meeting SO-03-02 can contribute to the fulfilment of UO-03		"include inline comments" and ensures clarity/maintainability.					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.94. System NonFunctional Requirements: SO-03-03

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-03-03				Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:12 PM						
Modification:	Oct 31 2025 08:13 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	All code changes must pass peer review focused on clarity and maintainability.				Organizational (sub-type below)		
					Development Requirements		
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UO-03					
Justify why meeting SO-03-03 can contribute to the fulfilment of UO-03		Operationalizes the “undergo peer review” clause in UO-03.					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.95. System NonFunctional Requirements: SO-04-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		SO-04-01			Type	Functional	Non-Functional
Creation:		Oct 30 2025 09:30 PM					
Modification:		Oct 30 2025 09:31 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:		Continuous-integration builds shall enforce unit-test coverage $\geq 80\%$.			Organizational (sub-type below)		
					Development Requirements		
Priority:		Highest	High	Medium	✓ Low		Lowest
This Req. is Engineered From:			UO-04				
Justify why meeting SO-04-01 can contribute to the fulfilment of UO-04							
Traceability:		Use cases cf.	N/A				
		Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025					

Table 4.96. System NonFunctional Requirements: SO-05-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-05-01				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:31 PM						
Modification:	Oct 30 2025 09:31 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	Release builds shall target API 33 or higher and be installable on Snapdragon 8-series or equivalent hardware.				Organizational (sub-type below)		
					Operational Requirements		
Priority:	Highest	High	Medium	✓ Low		Lowest	
This Req. is Engineered From:		UO-05					
Justify why meeting SO-05-01 can contribute to the fulfilment of UO-05							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.97. System NonFunctional Requirements: SO-06-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-06-01				Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:16 PM						
Modification:	Oct 31 2025 08:16 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The app shall include a built-in Help section (no network required) covering calibration, settings, and safety disclaimers.				Organizational (sub-type below)		
					Operational Requirements		
Priority:	Highest	High	Medium	Low	Lowest		
This Req. is Engineered From:		UO-06					
Justify why meeting SO-06-01 can contribute to the fulfilment of UO-06		Ensures a concise, always-available guide inside the app as UO-06 requires.					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.98. System NonFunctional Requirements: SO-06-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-06-02				Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:16 PM						
Modification:	Oct 31 2025 08:17 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The guide must clearly explain (a) calibration steps & pass/fail tips, (b) each setting’s effect/range/defaults, (c) safety disclaimers and appropriate us				Organizational (sub-type below)		
					Operational Requirements		
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Engineered From:		UO-06					
Justify why meeting SO-06-02 can contribute to the fulfilment of UO-06		Guarantees the exact topics and concise clarity mandated by UO-06.					
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.99. System NonFunctional Requirements: SO-06-03

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SO-06-03			Type	Functional	Non-Functional
Creation:	Oct 31 2025 08:17 PM					
Modification:	Oct 31 2025 08:17 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
				System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The guide shall meet accessibility basics and support future localization; relevant screens should deep-link to specific guide topics.			Organizational (sub-type below)		
				Operational Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest
This Req. is Engineered From:		UO-06				
Justify why meeting SO-06-03 can contribute to the fulfilment of UO-06		Makes the guide usable for all users and easy to expand, aligning with UO-06’s “concise user guide or in-app section.”				
Traceability:	Use cases cf.	N/A				
	Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment	Generated from the CapStone Process Management System ©2025					

Table 4.100. System NonFunctional Requirements: SO-07-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		SO-07-01				Type	Functional	Non-Functional
Creation:		Oct 30 2025 09:31 PM						
Modification:		Oct 30 2025 09:32 PM						
Description:		The application package shall include an HTML or PDF quick-start guide accessible through the Help menu.				Organizational (sub-type below)		
						Environmental Requirements		
Priority:	Highest	High	✓ Medium	Low		Lowest		
This Req. is Engineered From:		UO-07						
Justify why meeting SO-07-01 can contribute to the fulfilment of UO-07								
Traceability:	Use cases cf.	N/A						
	Test cases cf.	Yet to be completed in test case worksheet!						
Acknowledgment		Generated from the CapStone Process Management System ©2025						

Table 4.101. System NonFunctional Requirements: SO-07-02

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-07-02				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:32 PM						
Modification:	Oct 30 2025 09:32 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	Detection accuracy shall remain $\geq 90\%$ under daylight, cabin light, and low-light conditions.				Organizational (sub-type below)		
					Environmental Requirements		
Priority:	Highest	<input checked="" type="checkbox"/> High	Medium	Low		Lowest	
This Req. is Engineered From:		UO-07					
Justify why meeting SO-07-02 can contribute to the fulfilment of UO-07							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.102. System NonFunctional Requirements: SO-08-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform									
Requirement #:		SO-08-01				Type		Functional		Non-Functional	
Creation:		Oct 30 2025 09:33 PM									
Modification:		Oct 30 2025 09:33 PM				User		<input type="checkbox"/>		<input type="checkbox"/>	
						System		<input type="checkbox"/>		<input checked="" type="checkbox"/>	
Description:		The system shall function correctly in both portrait and landscape orientations without restarting the process.				Organizational (sub-type below)					
						Environmental Requirements					
Priority:		Highest		✓ High		Medium		Low		Lowest	
This Req. is Engineered From:			UO-08								
Justify why meeting SO-08-01 can contribute to the fulfilment of UO-08											
Traceability:		Use cases cf.		N/A							
		Test cases cf.		Yet to be completed in test case worksheet!							
Acknowledgment		Generated from the CapStone Process Management System ©2025									

Table 4.103. System NonFunctional Requirements: SO-09-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SO-09-01				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:34 PM						
Modification:	Oct 30 2025 09:34 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	All monitoring and alerting features shall remain fully functional offline.				Organizational (sub-type below)		
					Environmental Requirements		
Priority:	Highest	✓ High	Medium	Low		Lowest	
This Req. is Engineered From:		UO-09					
Justify why meeting SO-09-01 can contribute to the fulfilment of UO-09							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.104. System NonFunctional Requirements: SE-01-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SE-01-01				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:34 PM						
Modification:	Oct 30 2025 09:35 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	At startup, the application shall display a safety disclaimer and disable configuration changes while the vehicle is moving.				External (sub-type below)		
					Legislative Requirements on Safety/Security		
Priority:	Highest	✓ High	Medium	Low		Lowest	
This Req. is Engineered From:		UE-01					
Justify why meeting SE-01-01 can contribute to the fulfilment of UE-01							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.105. System NonFunctional Requirements: SE-03-01

Project Name:	Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:	SE-03-01				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:37 PM						
Modification:	Oct 30 2025 09:37 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The face-detection model shall be trained and validated on datasets representing diverse skin tones, facial features, and eyewear.				External (sub-type below)		
					Cultural and Social Requirements		
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Engineered From:		UE-03					
Justify why meeting SE-03-01 can contribute to the fulfilment of UE-03							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
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Table 4.106. System NonFunctional Requirements: SE-04-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:		SE-04-01			Type	Functional	Non-Functional
Creation:		Oct 30 2025 09:38 PM					
Modification:		Oct 30 2025 09:39 PM			User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:		The UI shall support English by default and be designed for easy localization using Android string resources.			External (sub-type below)		
					Cultural and Social Requirements		
Priority:		Highest	High	✓ Medium	Low		Lowest
This Req. is Engineered From:			UE-04				
Justify why meeting SE-04-01 can contribute to the fulfilment of UE-04							
Traceability:		Use cases cf.	N/A				
		Test cases cf.	Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025					

Table 4.107. System NonFunctional Requirements: SE-05-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform					
Requirement #:	SE-05-01				Type	Functional	Non-Functional
Creation:	Oct 30 2025 09:39 PM						
Modification:	Oct 30 2025 09:39 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
					System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:	The app shall use only stable Android Jetpack APIs (CameraX, AudioManager, Storage) and tested SDK versions.				External (sub-type below)		
					Interoperability Requirements		
Priority:	Highest	✓ High	Medium	Low	Lowest		
This Req. is Engineered From:		UE-05					
Justify why meeting SE-05-01 can contribute to the fulfilment of UE-05							
Traceability:	Use cases cf.	N/A					
	Test cases cf.	Yet to be completed in test case worksheet!					
Acknowledgment	Generated from the CapStone Process Management System ©2025						

Table 4.108. System NonFunctional Requirements: SE-06-01

Project Name:		Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform						
Requirement #:		SE-06-01				Type	Functional	Non-Functional
Creation:		Oct 30 2025 09:39 PM						
Modification:		Oct 30 2025 09:40 PM				User	<input type="checkbox"/>	<input type="checkbox"/>
						System	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Description:		The inference engine shall remain interoperable with Qualcomm QNN and Android NNAPI runtimes for hardware acceleration.				External (sub-type below)		
						Interoperability Requirements		
Priority:		Highest	✓ High	Medium	Low	Lowest		
This Req. is Engineered From:			UE-06					
Justify why meeting SE-06-01 can contribute to the fulfilment of UE-06								
Traceability:		Use cases cf.		N/A				
		Test cases cf.		Yet to be completed in test case worksheet!				
Acknowledgment		Generated from the CapStone Process Management System ©2025						

Table 4.109. Mapping from user requirements to system requirements

Project Name: Distracted/Drowsy Driver Detection on Snapdragon Mobile Platform			
User Requirements		System Requirements	
Req ID	Description	Req ID	Description
UE-01	The app shall include a startup safety disclaimer and disable manual interaction prompts while the vehicle is in motion.	SE-01-01	At startup, the application shall display a safety disclaimer and disable configuration changes while the vehicle is moving.
UE-03	The face-detection model shall be evaluated for consistent accuracy across diverse skin tones, facial structures, and eyewear.	SE-03-01	The face-detection model shall be trained and validated on datasets representing diverse skin tones, facial features, and eyewear.
UE-04	The interface and alert text shall default to English and be structured for easy localization into other languages.	SE-04-01	The UI shall support English by default and be designed for easy localization using Android string resources.
UE-05	The app shall utilize only stable Android Jetpack APIs to ensure device portability.	SE-05-01	The app shall use only stable Android Jetpack APIs (CameraX, AudioManager, Storage) and tested SDK versions.
UE-06	The app shall interoperate seamlessly with both Qualcomm QNN and Android NNAPI runtimes for ML acceleration without requiring code modifications.	SE-06-01	The inference engine shall remain interoperable with Qualcomm QNN and Android NNAPI runtimes for hardware acceleration.
UF-A	As a driver, I want to securely create accounts and log in using a username and password so that I can view my driving history.	SF-A-01	The system shall record instances of detected drowsiness or distraction for each trip, including timestamps
UF-B	As a driver, I want the system to detect signs of drowsiness in real-time on my face and eyes in order to promote driving safety.	SF-B-01	The system shall provide immediate audible and visual alerts when drowsiness or distraction is detected.
		SF-B-02	The system shall detect when the drivers eyes are closed for prolonged periods and trigger alerts.
UF-C	As a driver, I want the system to continuously monitor my face and eyes in real-time to detect signs of distraction in order to promote driving focus.	SF-C-01	The system shall detect when the drivers eyes are looking away from the road for prolonged periods and trigger alerts.
		SF-C-02	The system shall continuously process front-camera frames and estimate head yaw (θ). It shall raise a DISTRACTED event when the absolute yaw angle exceeds a configurable threshold for a sustained, configurable duration.
		SF-C-03	The system shall continuously estimate eye gaze and raise a DISTRACTED event when gaze deviates off the forward road region beyond configurable angular bounds for a sustained, configurable duration.
	As a driver, I should be able to configure	SF-D-01	The system shall provide a settings menu accessible to the driver.

UF-D	settings, such as volume of alerts or sensitivity of detection.	SF-D-02	The system shall allow the driver to adjust the volume of alerts.
		SF-D-03	The system shall allow the driver to adjust the sensitivity level of detection.
UF-E	As a driver, I want to start and stop the monitoring session manually so that I can control when the app analyzes my driving behavior.	SF-E-01	The system shall provide explicit controls to Start and Stop a monitoring session. On Start, it shall request camera permission if needed, initialize CameraX and on-device inference, and begin emitting detection events. On Stop, it shall tear down camera/inference and finalize the current session.
		SF-E-02	When the driver taps Start, the system shall execute a preflight flow that (a) verifies/requests camera permission, (b) verifies camera availability, and (c) initializes the monitoring pipeline only if all checks pass; otherwise it shall surface a clear, actionable error and remain stopped.
UF-F	As a driver, I want to receive real-time visual, audio, or vibration alerts when drowsiness or distraction is detected so that I can regain my attention immediately.	SF-F-02	When the system detects DROWSY or DISTRACTED, it shall emit an alert in ≤ 200 ms from the detection event, updating the UI banner and triggering device audio/vibration per current settings
		SF-F-03	The system shall select active alert modalities (visual, audio, vibration) based on user settings and device capability/state (ringer mode, DND, vibrator present). If a modality is unavailable, it shall fallback to available ones and always present a visual alert.
UF-G	As a driver, I want to acknowledge or snooze an alert to avoid repeated or unnecessary alarms while still staying aware of my condition.	SF-G-01	When the driver taps Acknowledge, the system shall immediately dismiss the current alert (visual/audio/vibration), stop any ongoing alert output, and continue monitoring.
		SF-G-02	When the driver taps Snooze, the system shall suppress alerts of the same type for a configurable cooldown while monitoring continues.
UF-H	As a driver, I want to calibrate the camera at the start of monitoring to ensure my face is properly positioned and lighting is sufficient.	SF-H-01	Before monitoring starts, the system shall present a Calibration flow and block Start until calibration passes or the user explicitly skips. If skipped or failed, the session starts in degraded mode (lower alert confidence) and shows an inline tip.
		SF-H-02	During calibration, the system shall show live guidance overlays (face box, eye markers) and evaluate position and pose stability until pass criteria are met.
		SF-I-01	The system shall provide a Summary screen that displays, for a chosen time range or session: total alerts by type (Drowsy,

UF-I	As a driver, I want to view or export a summary of my recent alerts or sessions to understand my drowsiness and distraction patterns.		Distracted), timestamps, session duration, and average PERCLOS; users can filter by Last Session, Today, 7 Days, or Custom Range.
		SF-I-02	The system shall persist per-session records locally and expose a query API to retrieve summaries for time windows.
UF-J	As a driver, I want assurance that my camera and data stays on my device so that my privacy is protected.	SF-J-01	The system shall perform all camera capture and ML inference on device and shall not transmit frames, embeddings, or detection results to any network endpoint.
		SF-J-02	The system shall store only session metadata and alert events in app-scoped storage; by default, it shall not persist raw images or video frames.
		SF-J-03	The system shall request only the minimum runtime permissions required (e.g., CAMERA) and shall block any background network requests originating from the monitoring module.
UF-K	As a system administrator, I want to deploy and configure the apps across multiple devices using managed Android tools so that updates are consistent and secure.	SF-K-01	The system shall support MDM-driven install/update with staged rollout (e.g., 5% → 25% → 100%), version pinning, and force-install on enrolled devices.
		SF-K-02	When allowed by MDM, the app shall honor policy to auto-grant CAMERA permission at install/update and halt monitoring if policy later revokes it, showing an admin-configured message.
UF-L	As a fleet manager, I want to view aggregated drowsiness and distraction statistics across drivers so that i can identify safety trends.	SF-L-01	The backend shall compute fleet-level KPIs over a selected time window: alerts per driving hour, counts by type (Drowsy/Distracted), sessions with ≥ 1 alert (%), and time-of-day/day-of-week distributions.
		SF-L-02	The system shall accept anonymized session summaries via an ingestion API or bulk import
		SF-L-03	The analytics service shall support filtering KPIs by organization, driver cohort/vehicle group, device model/app version, and date range.
UO-01	The app shall be developed in Android Studio (Kotlin) and tested on Snapdragon-based devices to validate hardware acceleration.	SO-01-01	Development shall use Android Studio Giraffe + Kotlin 1.9 with Git version control.
		SO-01-02	The codebase shall live in a single authoritative Git repository with protected branches.
UO-02	All source code shall reside in a Git Repository with branching and commit standards documented in the project README.	SO-02-01	CI shall block merges that violate documented branching and commit standards.
		SO-02-02	The repository shall include a README section detailing branching/commit rules and a PR template; CI validates their presence and

		version.
UO-03	Code shall follow Kotlin style conventions, include inline comments, and undergo peer review for clarity and maintainability.	SO-03-01 Enforce Kotlin style via automated linters in CI.
		SO-03-02 Require API docs and meaningful inline comments for non-obvious logic.
		SO-03-03 All code changes must pass peer review focused on clarity and maintainability.
UO-04	Each functional requirement shall be verified by at least one unit or integration test before milestone release.	SO-04-01 Continuous-integration builds shall enforce unit-test coverage $\geq 80\%$.
UO-05	The app shall be packaged as an APK targeting Android Level 33 or higher and installable without device root access.	SO-05-01 Release builds shall target API 33 or higher and be installable on Snapdragon 8-series or equivalent hardware.
UO-06	A concise user guide or in app section shall describe calibration, settings, and safety disclaimers.	SO-06-01 The app shall include a built-in Help section (no network required) covering calibration, settings, and safety disclaimers.
		SO-06-02 The guide must clearly explain (a) calibration steps & pass/fail tips, (b) each setting's effect/range/defaults, (c) safety disclaimers and appropriate us
		SO-06-03 The guide shall meet accessibility basics and support future localization; relevant screens should deep-link to specific guide topics.
UO-07	The system shall maintain detection accuracy under daylight, artificial, and low-light cabin conditions.	SO-07-01 The application package shall include an HTML or PDF quick-start guide accessible through the Help menu.
		SO-07-02 Detection accuracy shall remain $\geq 90\%$ under daylight, cabin light, and low-light conditions.
UO-08	The app shall operate correctly when the phone is mounted either in landscape or portrait orientation.	SO-08-01 The system shall function correctly in both portrait and landscape orientations without restarting the process.
UO-09	All detection, alerts, and settings shall operate fully without internet connection.	SO-09-01 All monitoring and alerting features shall remain fully functional offline.
UP-01	The app shall present an intuitive, minimal interface that requires no more than two user actions to begin monitoring.	SP-01-01 The system UI shall launch within 2 seconds and maintain a response time < 200 ms for all on-screen interactions.
UP-02	During active monitoring, no manual interaction shall be required.	SP-02-01 The system shall automatically start monitoring when the driver presses "Start Session," requiring no further manual input.
UP-03	Visual, audio and vibration alerts shall be easily distinguishable and convey meaning without confusing or startling the driver.	SP-03-01 The alert subsystem shall generate visual, audio, and haptic feedback signals that are synchronized within ± 50 ms.
UP-04	Interface text size, contrast, and color schemes shall conform to WCAG 2.1 AA accessibility guidelines where feasible on Android	SP-04-01 All UI text and contrast ratios shall conform to WCAG 2.1 AA standards for accessibility.
		SP-05-01 The inference module shall process ≥ 15 frames per second and issue alerts within 200

UP-05	The system shall maintain at least 15 FPS processing speed and alert latency less than or equal to 200 ms from detection to notification.		ms of detection.
		SP-05-02	During continuous operation, average CPU utilization shall not exceed 40 %, and thermal throttling shall be avoided through adaptive frame skipping.
UP-06	Model inference shall execute locally using Snapdragon CPU/GPU/NPU resources while keeping sustained CPU utilization under 40 percent	SP-06-01	Inference must execute locally using Snapdragon CPU/GPU/NPU via QNN/NNAPI, with preferred NPU then GPU, falling back to CPU only if required.
UP-07	The app shall automatically reduce inference frequency if device temperature or battery drain exceeds safe thresholds.	SP-07-01	When device temperature or battery drain exceeds safe thresholds, the app shall automatically reduce inference frequency (FPS) and/or input resolution to lower load.
UP-08	The app shall operate continuously for sessions up to two hours without crash, freeze or data loss	SP-08-01	The monitoring process shall run stably for at least 2 hours without crash, memory leak, or data loss.
UP-09	Upon hardware or model failure, the system shall suspend monitoring and inform the user rather than issue false alerts.	SP-09-01	On hardware or model failure, the system shall halt inference and display a “Safe Mode” warning.
UP-10	All captured data shall remain in app-scoped storage, no external transmission occurs unless explicitly authorized	SP-10-01	All data logs and configuration files shall be stored in app-scoped encrypted storage and deleted upon user request.
UP-11	The system shall request only essential Android permissions (Camera, Audio, Vibration, Storage) and respect user revocation at runtime.	SP-11-01	The application shall respect Android runtime permission revocations and immediately disable camera or microphone access.

Acknowledgment: Generated from the CapStone process management system ©2025