L&T Technology Services

Document History

Ver.Rel. No.	Release Date	Prepared. By	Reviewed By	Approved By	Remarks/Revision Details

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1.0 Introduction:

RKE (Remote Keyless Entry):

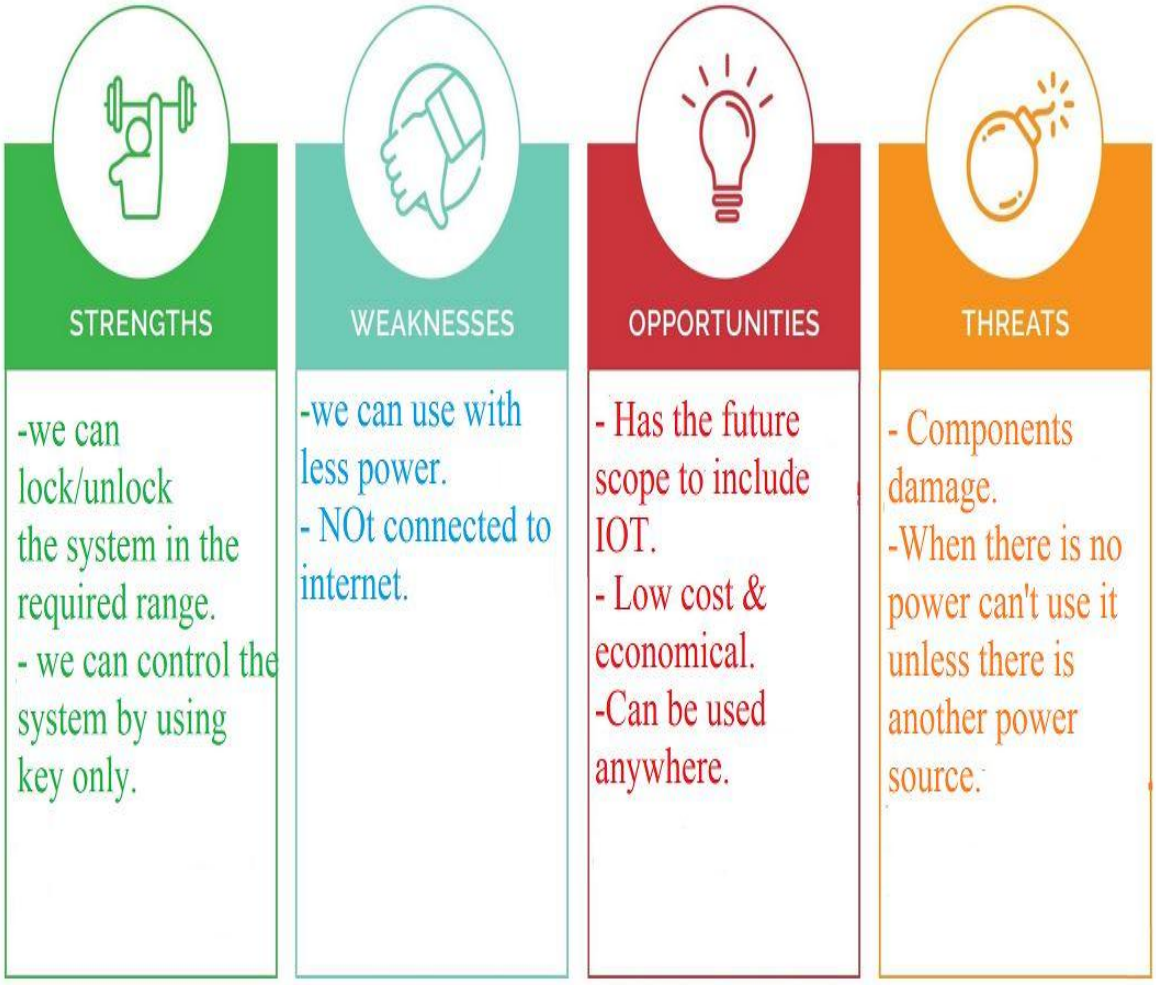
Remote keyless entry (RKE) is an electronic access system that can be controlled from a distance. RKEs, which are typically used to remotely lock or unlock doors, require the end user to initiate an action that will cause a physical or software key fob to transmit a radio signal to a receiver that controls an electronic lock. Typically, the action is to press a button on a physical fob or mobile app.

Remote keyless entry, which is commonly used to protect vehicles from theft, can be contrasted with passive keyless entry (PKE), which does not require any action on the part of the end user. Most RKEs operate at a frequency of 315 MHz for North America-made cars and at 433.32 MHZ for European, Japanese and Asian cars. Modern systems since the mid-1990s implement encryption as well as rotating entry codes to prevent car thieves from intercepting and spoofing the signal. A controller chip in the receiver changes the exact frequency required for RKE each time the lock is accessed, a security feature known as rolling code or hopping code.

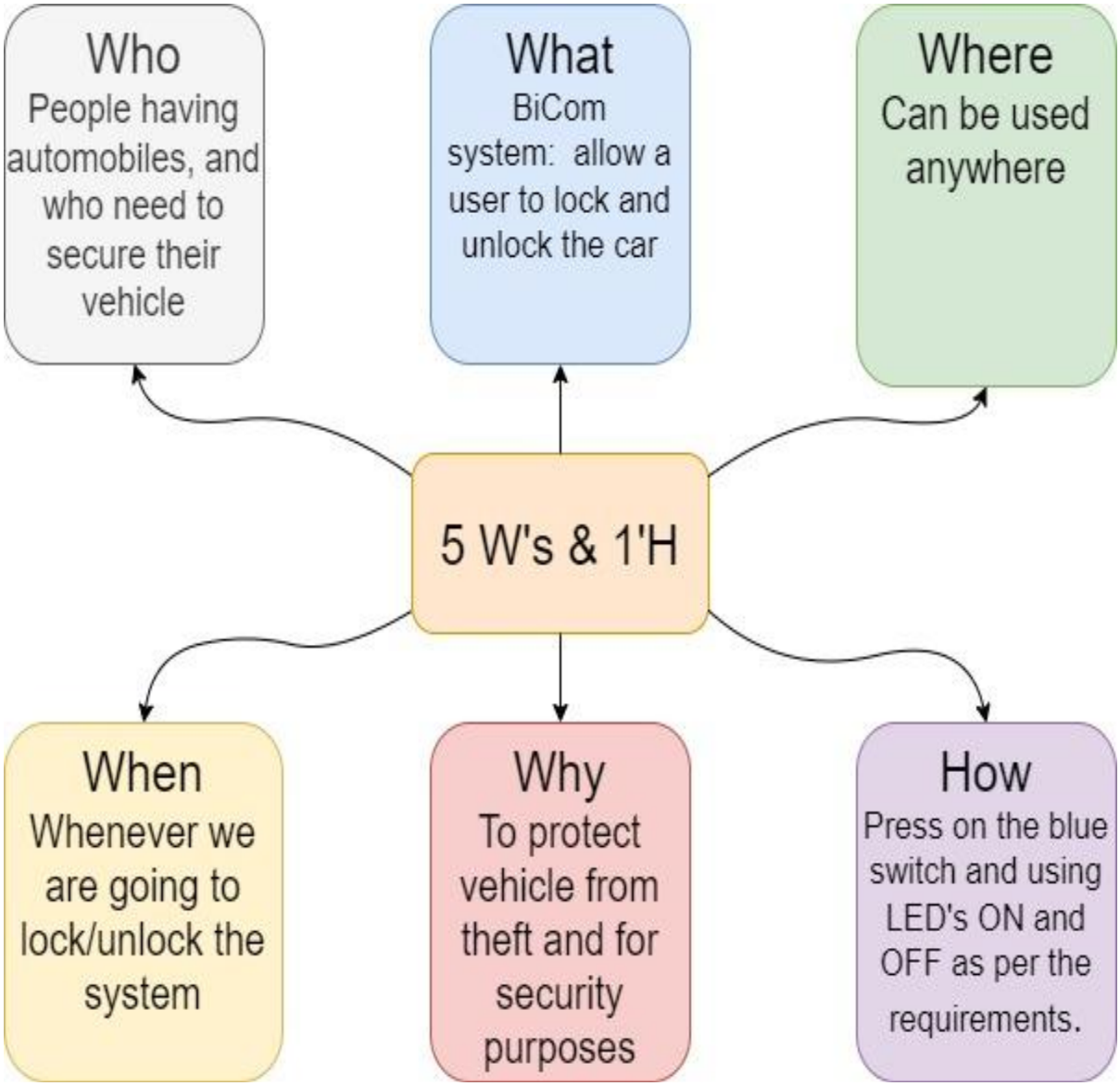
2.0 Requirements:

2.1 SWOT ANALYSIS:

SWOT ANALYSIS



2.2 5WHS AND 1H:



2.3 Table of Requirements

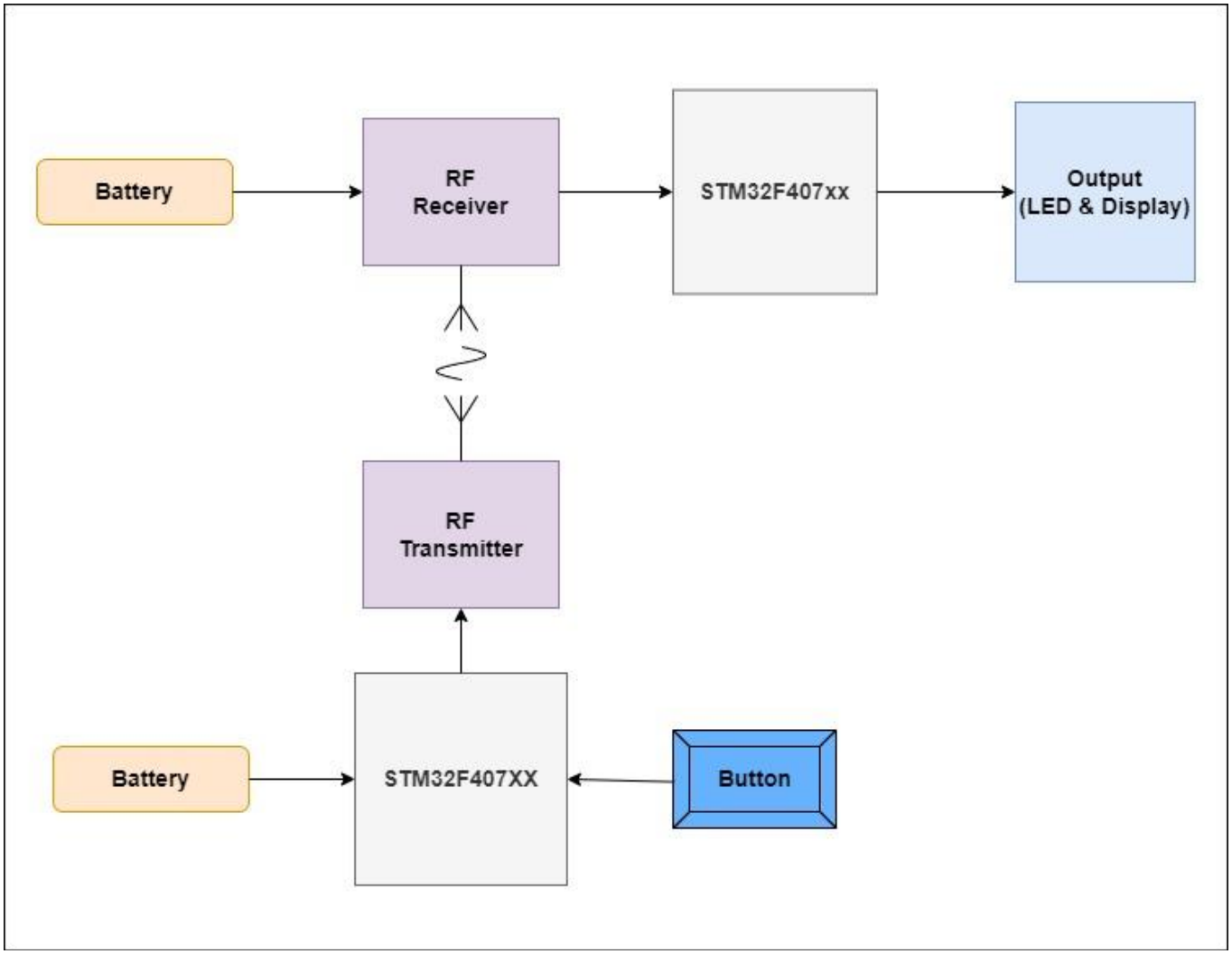
High Level Requirements:

ID	Description
HLR-1	It shall check window status
HLR-2	It shall check alarm status
HLR-3	It shall get the battery information
HLR-4	It shall check the door status

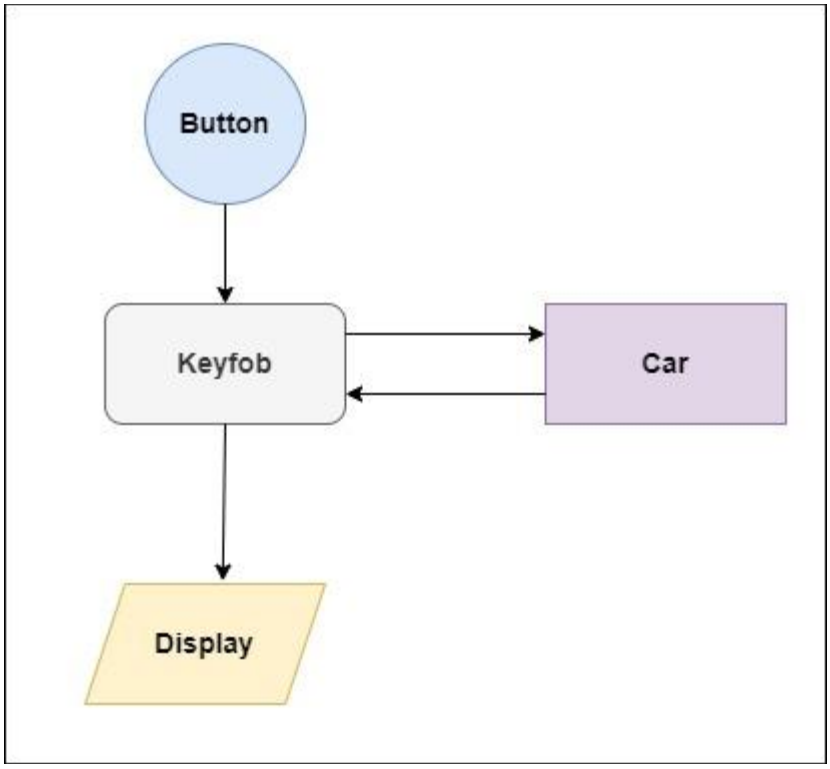
Low Level Requirements:

ID	Description
LLR-1	The system should check window status the when blue switch is pressed once
LLR-2	The system should check alarm status when the blue switch is pressed twice
LLR-3	The system should It shall get the battery information when the blue switch is pressed three times
LLR-4	The system should check the door status when the blue switch is pressed four times

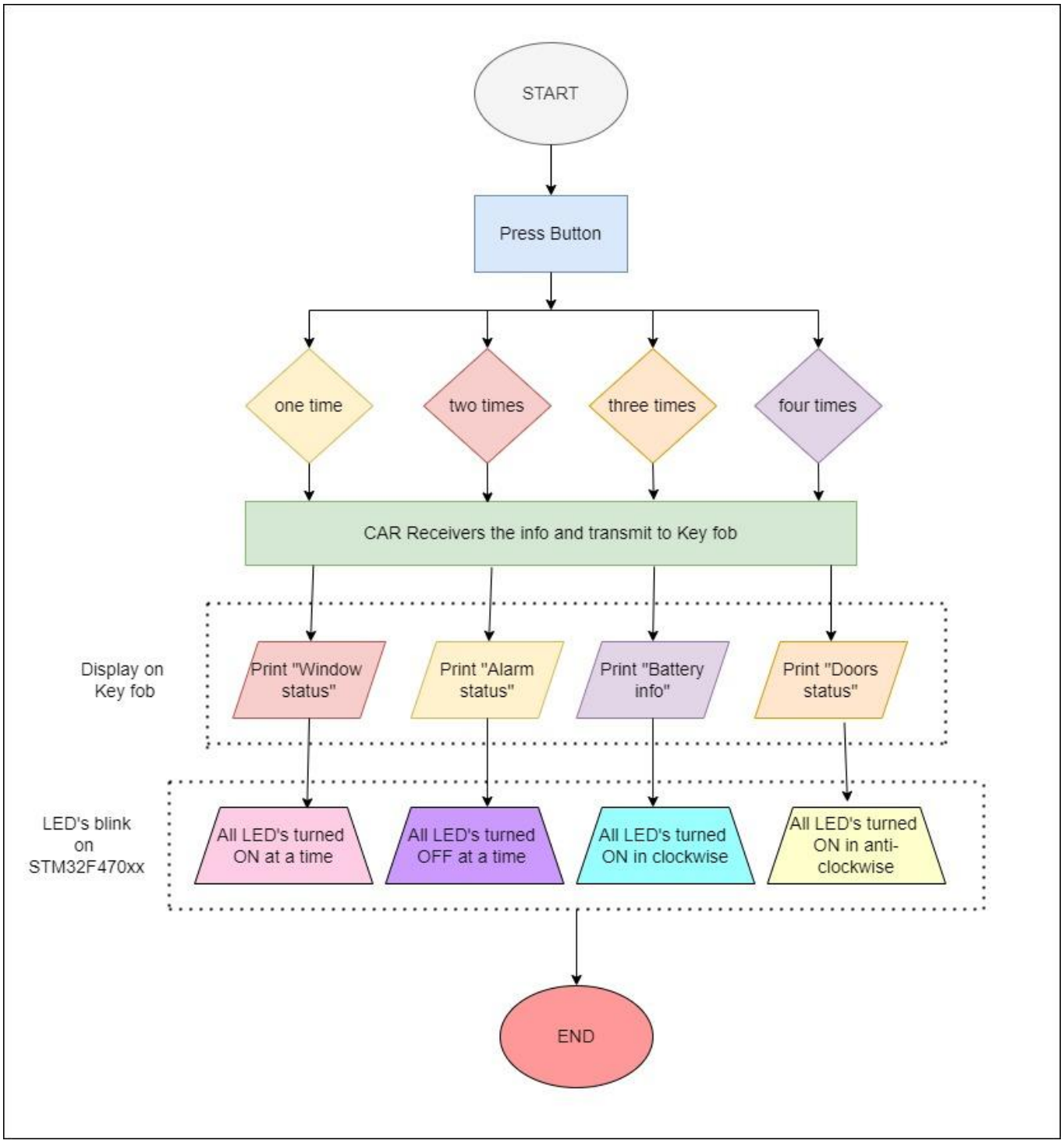
3.0 Architecture:



Structural Design:



Behavioural Design:


START
Press Button
one time
two times
three times
four times
CAR Receivers the info and transmit to Key fob
Display on Key fob
Print "Window status"
Print "Alarm status"
Print "Battery info"
Print "Doors status"
LED's blink on STM32F470xx
All LED's turned ON at a time
All LED's turned OFF at a time
All LED's turned ON in clockwise
All LED's turned ON in anti-clockwise
END

4.0 Simulation:

Test ID	Test Case objective	Input data	Input data
TC-01	check encryption	3+4	7
TC-02	check window status	7 & press the blue switch once	system should print window status when all led on at same time
TC_03	check alarm status	press the blue switch is pressed twice	system should print alarm status when all led off at same time
TC_04	get car battery information	press the blue switch three times	system should print car battery information when all led on in clockwise manner
TC_05	Check door status	press the blue switch four	system should print door status when all led on in anti-clockwise manner