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# "WHISPERINGHOPE" SMARTFANTOAVOID SUICIDE USING LOGIC GATES

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***Abstract:***This project aims to design, develop, and implement a ceiling fan safetysystem using logic gatetechnologyto prevent suicides byhanging. Recognizingtheriskposed byceiling fans in such tragicevents, this project focuses on enhancinghousehold safety through technological innovation. The system integrates weight and motion sensors into the fan, enabling it to detect abnormal conditions indicative of potential suicideattempts.These sensors feed dataintoa logic gatecircuit, which processes the inputs to make real-time decisions regarding the fan's operation. The development process involved creating a robust logic gate circuit usingAND,OR,andNOTgates toensureaccuratedecision-making.Acontrol unitwas designedtointerpretthelogicgate outputs,triggeringsafetymechanismssuchas deactivatingthefan or soundingalarmswhen dangerous conditionsaredetected.To ensure the system's reliability and effectiveness, multiple fail-safes and redundancies were implemented. Additionally, a user- friendly interface was developed for monitoring and managing the system, providing timely alerts and notifications. Extensive testing and validation were conducted to ensure the system's performance under various conditions and environments, ensuring it meets allrelevant safetystandards andregulations. Theproject also involved planning for thedeployment andmaintenance of the system in residentialand commercialsettings, ensuring easeofinstallation andlong-termreliability. In conclusion,theceiling fan safety system effectively enhances household safety by preventing its misuse for suicide attempts. The comprehensive design, rigorous testing, and user-centric interface make it a viable solution for reducing such risks, underscoring the critical role of technology in promoting safety and well-being in domestic environments. The project's scope covers not only the immediate implementation but also long-term maintenance and regulatorycompliance, ensuring sustainable and widespread application

***IndexTerms*–LogicGates, Safety,Sensors.**

## I. INTRODUCTION

Suicidepreventionisacriticalissue,andtechnologycanplayasignificantroleinsavinglives.Afansystemaimstoreducetherisk ofsuicidebyhanging,particularlyin settingswheresuchincidentsmayoccur,likehospitals,psychiatricfacilities,andschools.The increasingprevalenceofsuicide,particularlythroughhanging,hasnecessitatedinnovativepreventive measures.Onesuchmeasure isthedevelopmentofafan systemdesignedtoavertsuicideattempts byhanging.This systemintegratestechnology,including weight sensors, motion detectors, and to detect and respond to potential threats. By automatically shutting down the fan and alerting authorities whenunusualweightoractivityisdetected,thefansystemoffersaproactivesolutiontoacriticalissue.This technology not only enhances safety but also provides peace of mind to caregivers and administrators, making environments like hospitals, psychiatricfacilities,andschoolssafer for vulnerableindividuals.Inrecentyears,thefocuson enhancing safetyfeatures in household applianceshasintensified,drivenbytheneedtopreventaccidentalorintentionalharm.Amongtheseappliances,ceili

ngfansposea particular risk, especiallyconcerning potential suicides byhanging. Toaddressthis issue,a novelapproach involves integratinglogic gate-basedcontrol systemsintofan operations.Thisinnovative solution leverages weightandmotion sensorscombinedwithlogic gatecircuitstomonitorandcontrolthefan'sfunctionality,ensuringitoperatesonlyundersafeconditions.Bypreventingmisuseand enablingtimelyintervention,thissystemaimstosignificantlyreducetheriskofsuicideattemptsinvolvingceilingfans,highlighting thecrucialroleoftechnologyin promoting safetyand well-beingin domesticenvironments. However,theimplementation ofsuch systemsalsopresentschallenges,such asmaintainingprivacyandmanagingcosts.Despitethesehurdles,thefan systemrepresents a significant step forward in suicide prevention efforts.

## II. LITERATURESURVEY

S.Sankaranarayananet.al.[1]proposedasystemforpreventingsuicideonceilingfan.Theproposedprojectsystemincludesa PIC 16f877amicrocontroller,a PIRsensor,a flex sensor,a GSMmodule,a buzzer,and an actuator. MPLABIDEhave been used for theprogrammingpurposeandproteussimulationsoftwareisusedforthesimulationpurpose.ThePIRsensordetects thepresence ofahuman,theflexsensordetectsthepresenceofadditionalweightontheceilingfan,theGSMmoduleisusedtosendthemessage to the registered mobile number, and the motor or actuator which is linked to the ceiling fan to safeguard the hanging. Abinash Mishra et. al. [2]have proposed a new safetydesign of a ceiling fan toavoid suicide Attempts. Prior to designing a new model, they performed a stress analysis on all of the existing general model fans to determine the force the fan's weight exerted on the down rod. The down rod is replaced in the new design by a spring that is attached to a home's ceiling fan. For a spring to be connected toa fan, theyhave designeda spring connector which ismechanicallyconnected tothe disc of a fan. The design of a springisdoneinsucha waythat,it shouldcarryaminimumweight sothat when someonetriestohangthemselftoa fanthenthe springwillelongateandcomedownmakingaperson'sfeettouchtheground.RaghavendraSNarsapur et.al.[3]haveproposed a system consistingofaceilingfanwithhardwarecomponentsofRENESASmicrocontroller,PIRandForcesensor,Buzzer, GSM module,switchandDCmotor.AndsoftwareusedareCubesuite+andRENESASflashprogrammer.Themicrocontrollerlocated atthecentreoftheblockdiagramformsthecontrolunitoftheentireproject.Theyhaveuseddcmotortocontrolthemovement of afanandtocontrolthemotortheyhaveusedl293Dmotordriver.Whenverthepersontriestohangtheforcesensorsensestheset weight, ifit’smorethanthe set point weight, the beam gets elongatedandcomes down, andalarmisactivatedandGSMmodule willsendanalertmessagetotherespectiveguardianPrabhaSundaravadiveet.al.[4]haveproposedanIoT-basedEdgeintelligent Framework for Suicidal Ideation Detection. This system has concentrated on creating an IoTbased framework that can assist in continually monitoring a person's behavioural and physiological data. The suggested M-SID framework encourages the developmentofaspecialsuicidalideationelicitationtechniqueforitsusers.Thefirstgoalwastocheeruptheuserand divertthem from making a decision toharm themselves. Thecomputer work is concentrated on tracking a person's overall movement, heart rate, and environment. The custom wearable is created with the aid of "generic" commercially available sensors that have been tailoredtotherequiredparametersinordertovalidatethehypothesis.TheM-SIDwearableusesatemperatureandhumiditysensor totracktheuser'senvironmentoveraspecifiedtime.Thedevicewilldisplaytheresultsas"vulnerableevent,""criticalevent,"and "normal event" in accordance after receiving these all parameters from the pulse oximeter, a medical-grade sensor that assists in dailyheartratecollection. Wassim Bouachiret.al.[5]positedanintelligentvideosurveillancesystemforautomateddetection of suicide attempts by hanging. By utilising the depth data obtained from an RGB-D camera, this proposed system is capable of simulatingsuicidal behaviour well.TheuseofRGB-Dcamerasopenedupanewavenuefor solvingposeestimation problemsin real time. They provide innovative solutions for dealing with the identification of activities based on eyesight. This approach is basedonmakinguseofthe3Dvisualdatacapturedbyanaffordable RGB-Dcamera.Thisspecificallyinvolvesusinghumanjoint relative positions in the 3d space to calculate position

and motion attributes during movement in order to grasp the activity of interest. Each ongoing observation is processed by their recognition system, which then does a binary ranking to identify any suicidal behaviour.Ifthepercentageof positive observationsexceedsa specificthreshold over thecourseofa sliding brief window, the activity of interest is eventually discovered

## III.RESEARCHMETHODOLOGY

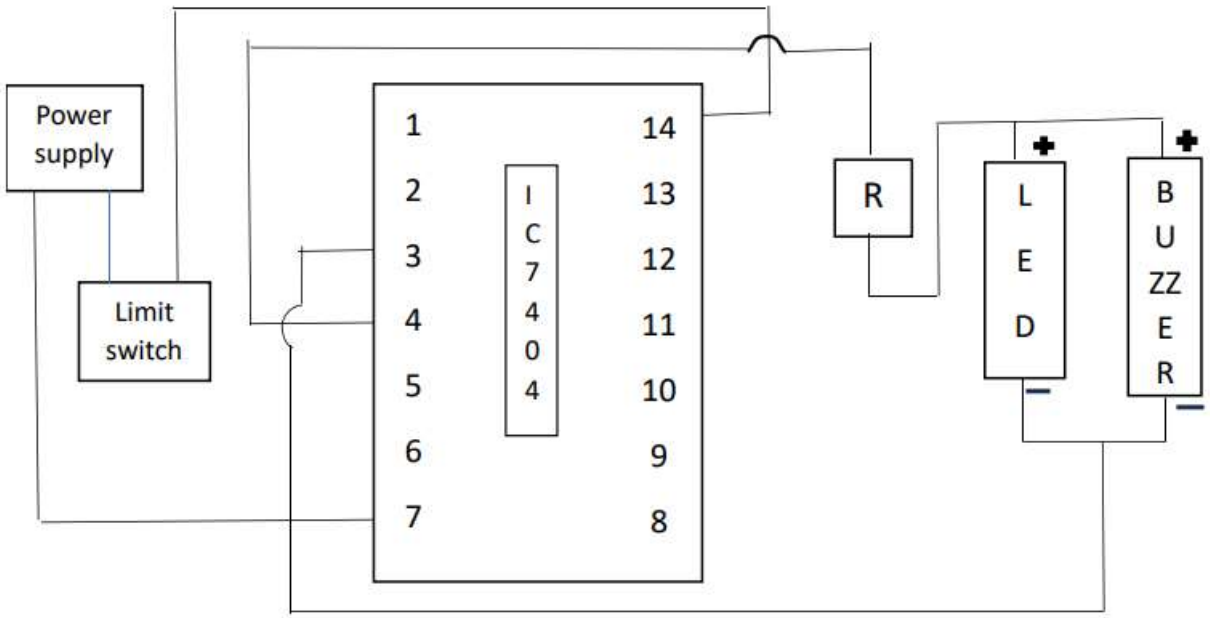


Figure.1BlockDiagram

Thedevelopmentprocessinvolvedcreatingarobustlogicgatecircuitusing AND, OR,andNOTgatestoensureaccuratedecision- making. A control unit was designed to interpret thelogic gate outputs, triggering safetymechanisms such as deactivating thefan or soundingalarmswhendangerousconditionsaredetected.Toensurethesystem'sreliabilityandeffectiveness, multiplefail-safes andredundancieswereimplemented.Additionally,auserfriendlyinterfacewasdevelopedformonitoringandmanagingthesystem, providing timelyalerts and notifications. When thelimit switch is pressed, it completes the circuit, allowing current to flow from thepower supplytotheintegrated circuit (IC). TheIC,with its 14pins,processes theinputfromthelimit switch.Pins 1 and14 of theICarelikelyconnectedtothepower supply(Vcc), andGND). Thesignalfromthelimitswitch isreceivedbytheICthroughits input pins (possibly pins 2, 3, and 4). The IC then processes this input and produces an output signal through pin 8. This output signalisroutedthrougharesistortolimitthecurrentbeforereachingtheLEDandthebuzzer.Consequently,theLEDlights upand the buzzer emits a sound, indicating that the limit switch has been triggered. The resistor ensures that the current to the LED is appropriate, preventing it from burning out. When the limit switch is activated, it sends a signal to the IC. The IC then processes thisinputandoutputsa signaltolight uptheLEDandsoundthebuzzer, indicatingthelimit switchhasbeen triggered.Theresistor ensures the LED receives an appropriate current to function without damage.

## III. RESULTSANDDISCUSSION

The results demonstrate that a logic gate-based approach can effectivelyenhance the safetyof a smart fan bypreventing its operation under dangerousconditions.Thelogicgateconfiguration, ensuresquick andaccurateresponsetopotentialrisks. By focusing on simplified logic gate design, and user experience, this smart fan system offers an effective, scalable, and ethical solution for preventing suicide attempts.

Figure2:Projectmodel

## IV. CONCLUSION

In conclusion, the ceiling fan safety system effectively enhances household safety by preventing its misuse for suicide attempts. The comprehensive design, rigorous testing, and user-centric interface make it a viable solution for reducing such risks, underscoring the critical role of technology in promoting safety and well-being in domestic environments. The project's scope coversnotonlytheimmediateimplementationbutalsolong-termmaintenanceandregulatorycompliance,ensuringsustainableand widespread application. Integrating logic gates into ceiling fan technology presents a promising approach to suicide prevention. Whiletherearechallenges toaddress, particularlyregardingsensor accuracyandprivacyconcerns, thepotentialbenefits in saving lives make this a valuable area of research and development. Continued innovation and ethical considerations will be key to the successful implementation of such technologies

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