ENGINEERING DESIGN ASSIGNMENT
END SEM PROJECT

THE SENSORIZED TRIGGER TAP

SUBMITTED BY

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INTRODUCTION :

An automatic faucet or tap (also hands-free faucet, touchless faucet, electronic faucet, motion-sensing faucet, sensor faucet, or infrared faucet) is a faucet equipped with a proximity sensor and mechanism that opens its valve to allow water to flow in response to the presence of a user's hands in close proximity. In addition it also comes up with a light (LED) attached and thus the water changes with respect to the colour. The faucet closes its valve again after a few seconds or when it no longer detects the presence of a user's hands.

(NORMAL TAP)

OBJECTIVE :

- *The main objective of* **Sensor** *tap water is to wash hands touch free .(Without touching the taps).*
- *To provide Energy friendly , Fast pipe/tap system .*
- *To avoid leakage of water .*
- *To keep water at same temperature .*

PROBLEM STATEMENT :

- *While washing our hands , Dirty taps need to be touched which is not a good hygiene .*
- *There is some leakage of water as taps are not properly closed .*
- *Cap of Pipe need to tightened and cleaned at intervals .*

NEED STATEMENT :

- *Our hands should be free of Impurities present in the taps .*
- *Conservation of water .*
- *Does not require more maintenance .*

FUNCTIONS :

- *Sensor- it detects the hand movements and automatically open the tap*
- *Nozzle - The water comes out of the pipe through nozzle*
- *Mount - To mount the tap on basin or wall*
- *Power source- The sensor is connected with a power source to keep it active at all times*
- *Pipe- Water flows from the tank to nozzle through pipe.*
- *Infrared Sensor Component – Sensor detects the object before the tap and sends a signal to solenoidal valve to start stream of water .*
- *Power source – Part of model likely to be controlled by AA batteries or by mains through 6V transformers .*

CONSIDERATIONS :

- *Energy Efficient*
- *Water Conservation*
- *Good level of Convenience*
- *Long lasting*
- *Built in Strong*

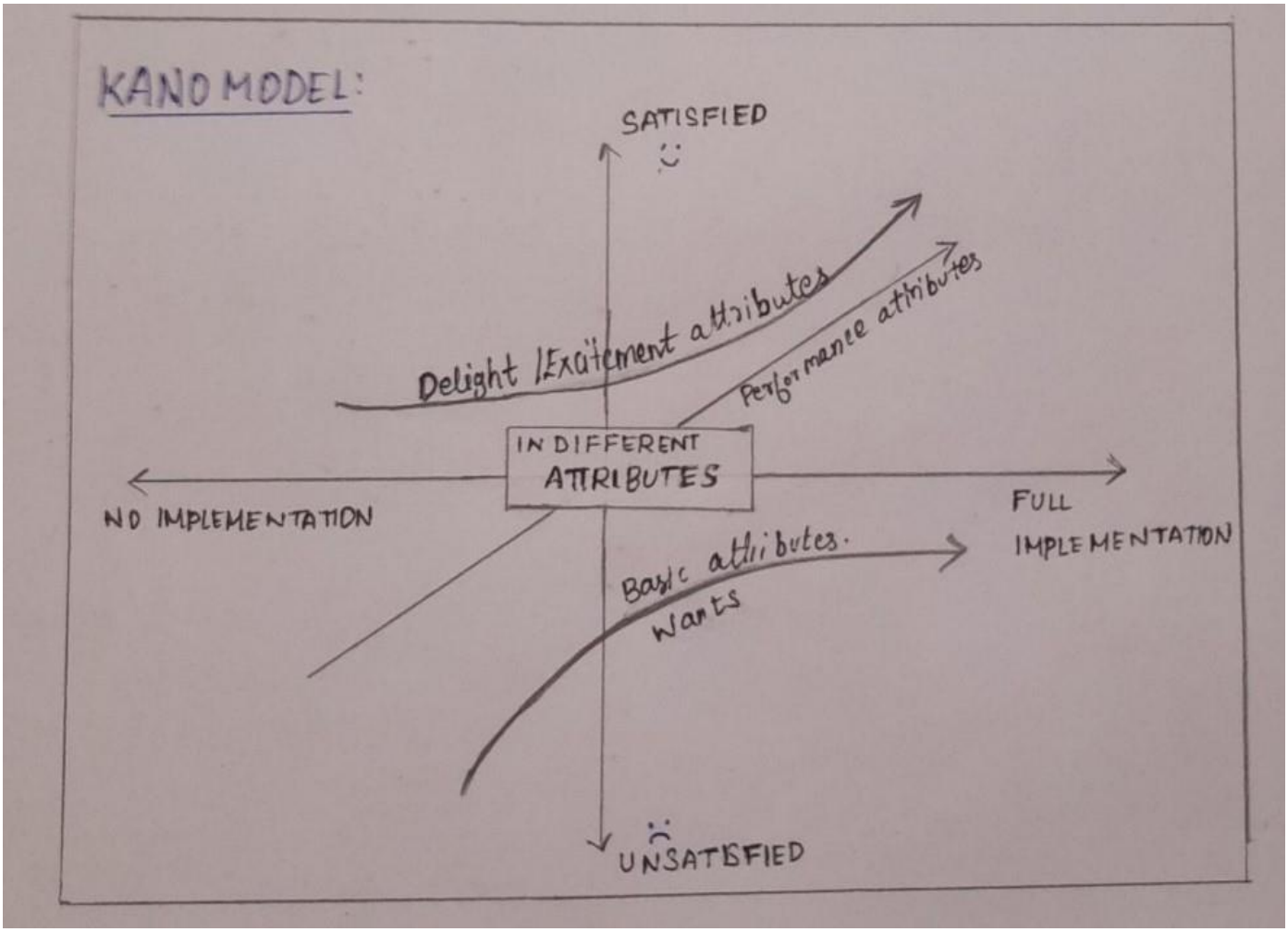
CUSTOMER REQUIREMENTS :

- *It should be Cost effective and affordable*
- *Should be easily available*
- *Require Less maintenance*
- *Should be attractive*
- *Should be Durable*
- *Should consume low Power*

CONSTRAINS :

- *Its Price range should be Minimal*
- *Should be accessible even if there is a Water cut*
- *The widget should not have any problems with reflective surface*
- *Replacable parts should be easily available*

KANO MODEL :



THRESHOLD ATTRIBUTES :

- *Get fine Flow of water*
- *Clean and clear water without Impurities*

PERFORMANCE ATTRIBUTES :

- *Easy switching on of the tap (AI sensor)*
- *Water filteration is done*

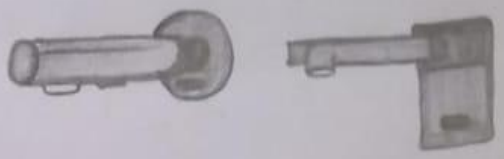
EXCITEMENT ATTRIBUTES :

- *Energy Efficient*
- *Comes up with hand dryer*
- *More durable than hand operated pipes*
- *LED light is fixed*
- *Gives a alarm when the tap is on for more than 2 mins*

INDIFFERENT ATTRIBUTES :

- *Colour*
- *Shape/Type*
- *Light*

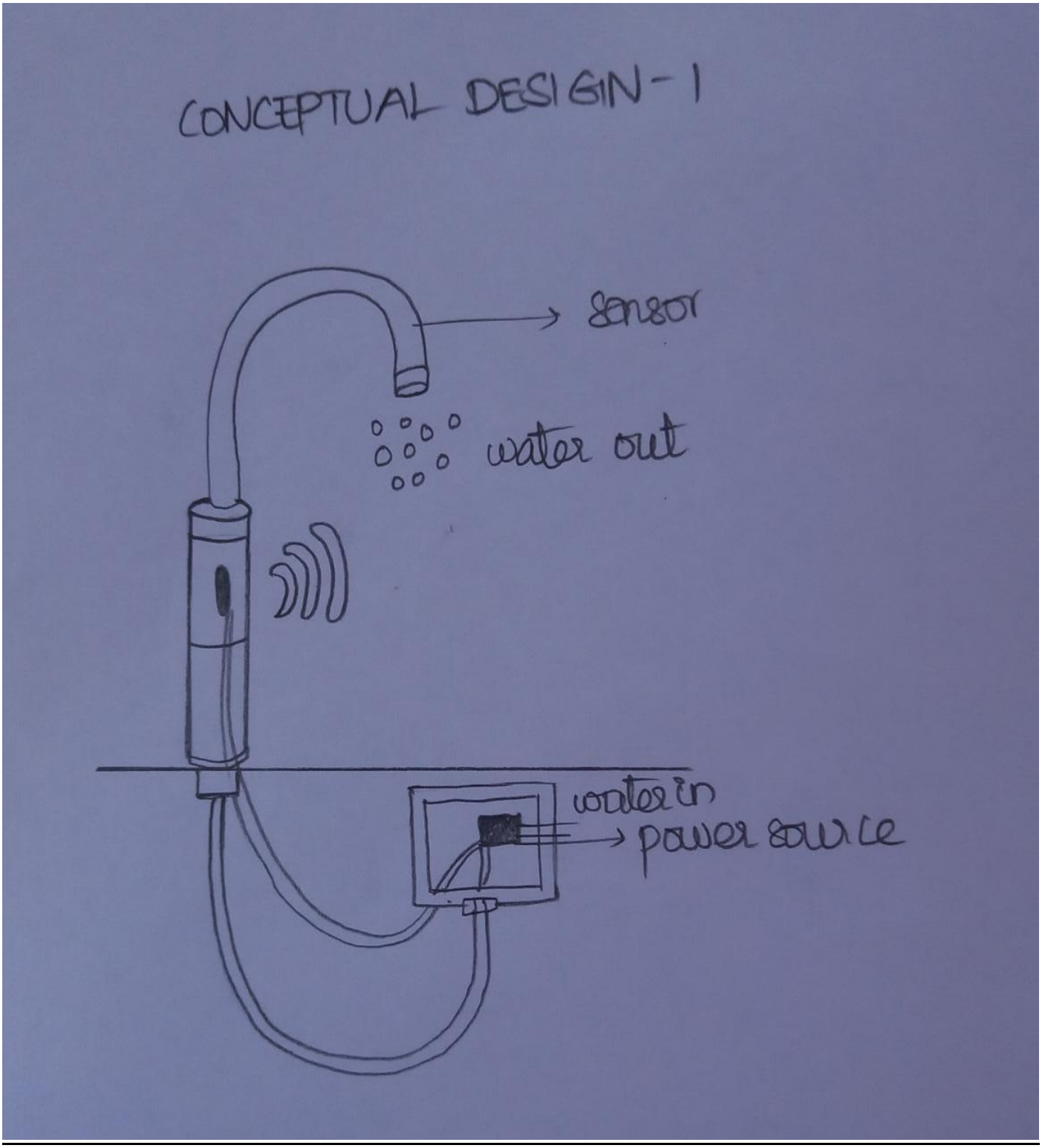
<u>MORPHOLOGICAL CHART :</u>

FEATURES	1	2	3	4
STRUCTURE				
SENSOR	INFRARED SENSORS	AUTOMATED SENSORS		
MOUNT	Basin mounted 	Wall mounted 		
NOZZLE	 Shower type	 spring type	 spray type	
location of sensor	 on the pipe	 on the nozzle	 on the stand mounted on the wall	
Material	carbon steel	high speed steel		

CONCEPTUAL DESIGN – 1 :

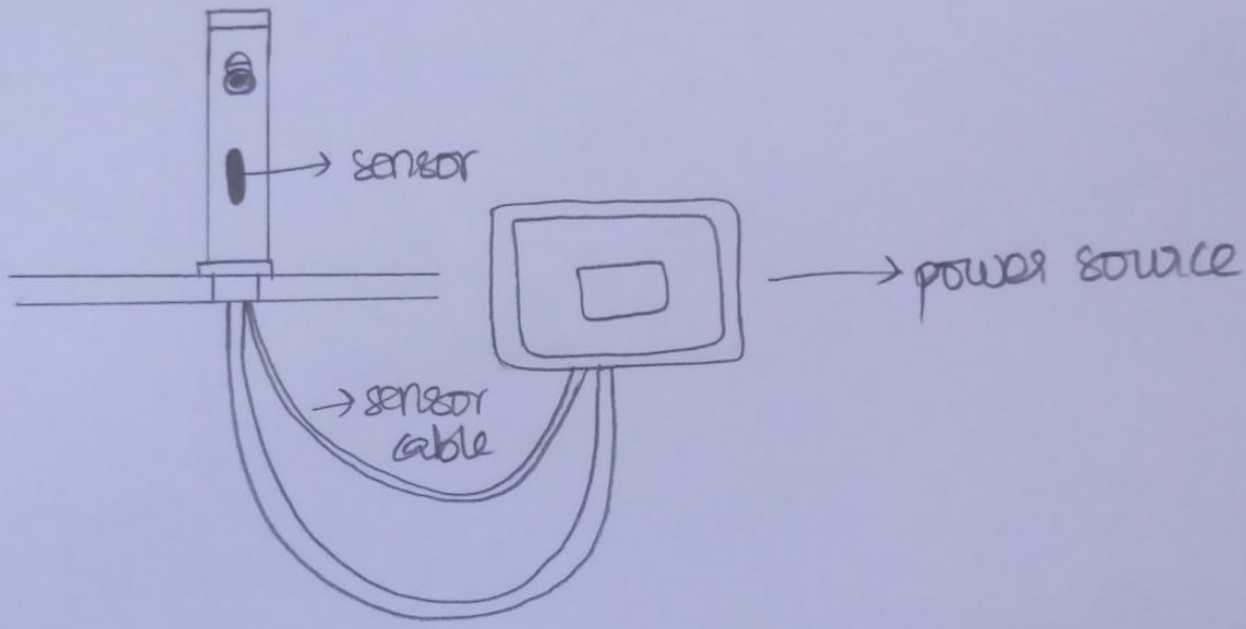
CONCEPTUAL DESIGN - 1

feature	idea
structure	1
sensor	1
Mount	1
Nozzle	2
Location of sensor	1
Material	1.



CONCEPTUAL DESIGN – 2 :

CONCEPTUAL DESIGN-2

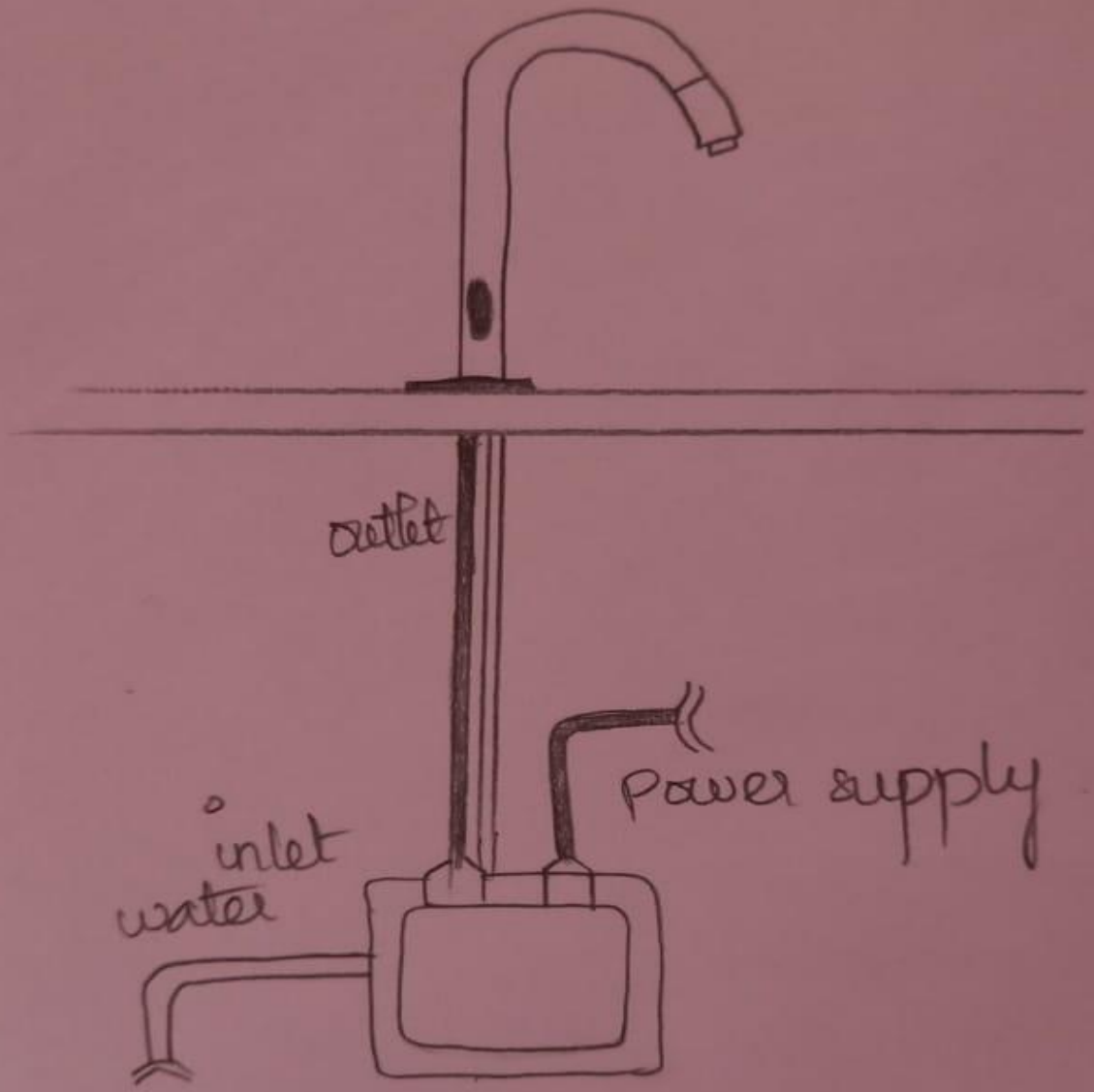


CONCEPTUAL DESIGN - 2

Feature	idea
Structure	4
Sensor	1
Mount	2
Nozzle	2
Location of sensor	3
Material	2

FINAL DESIGN :

FINAL DESIGN



MORPHOLOGICAL CHART OF FINAL DEESIGN :

MORPHOLOGICAL CHART OF FINAL DESIGN

FEATURES	IDEA
STRUCTURE	
SENSOR	INFRARED SENSOR
MOUNT	BASIN MOUNTED. (1)
NOZZLE	spring type nozzle 
LOCATION OF SENSOR	ON THE PIPE ITSELF 
MATERIALS	Coolbon steel

overall rating : 8/10

Performance : 9/10.

CONCLUSION :

Our final design is a combination of both design 1 and design 2 as it has the features of both. It is a basin mounted one and the sensor is located on the front of the pipe so it is better to detect the hand movements so it automatically allows the water to flow. Moreover these taps allow us to be more hygienic as it prevents touching. It also conserves water and help us to wash our hands with coziness .