



SMART TILES

For Fall Detection



Problem Statement

It is quite common in the case of old people for losing consciousness while accessing toilets, and as a result collapsing on the floor. Slippery tiles also result in a similar outcome.

Proposed Solution

Piezoelectric sensors could be used for fall detection and set off an alarm if so happens.

- Piezoelectric sensors will be laid all across the bathroom.
- If someone falls, that can be detected by the sensors, which can set off the alarm.
- They will adequately placed, such as to not make excessive sensors unnecessary and at the same time.

Calibration

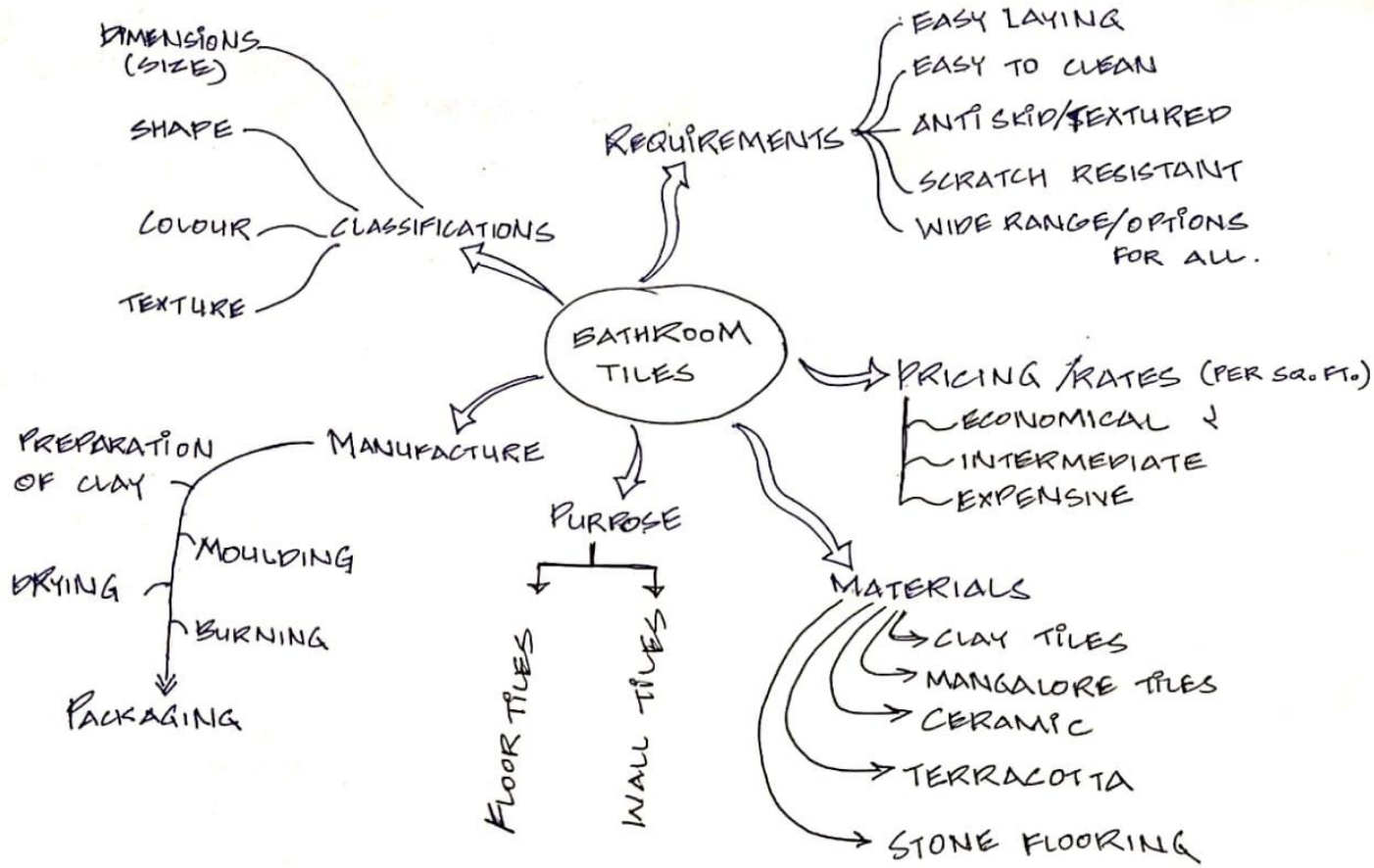
- The sensors will be calibrated in accordance to the person who will be using the facility.
- In households, where it is required, multiple calibrations settings for different people can be used.
- This calibration will ensure that only a fall is detected and other instances do not set the alarm off.

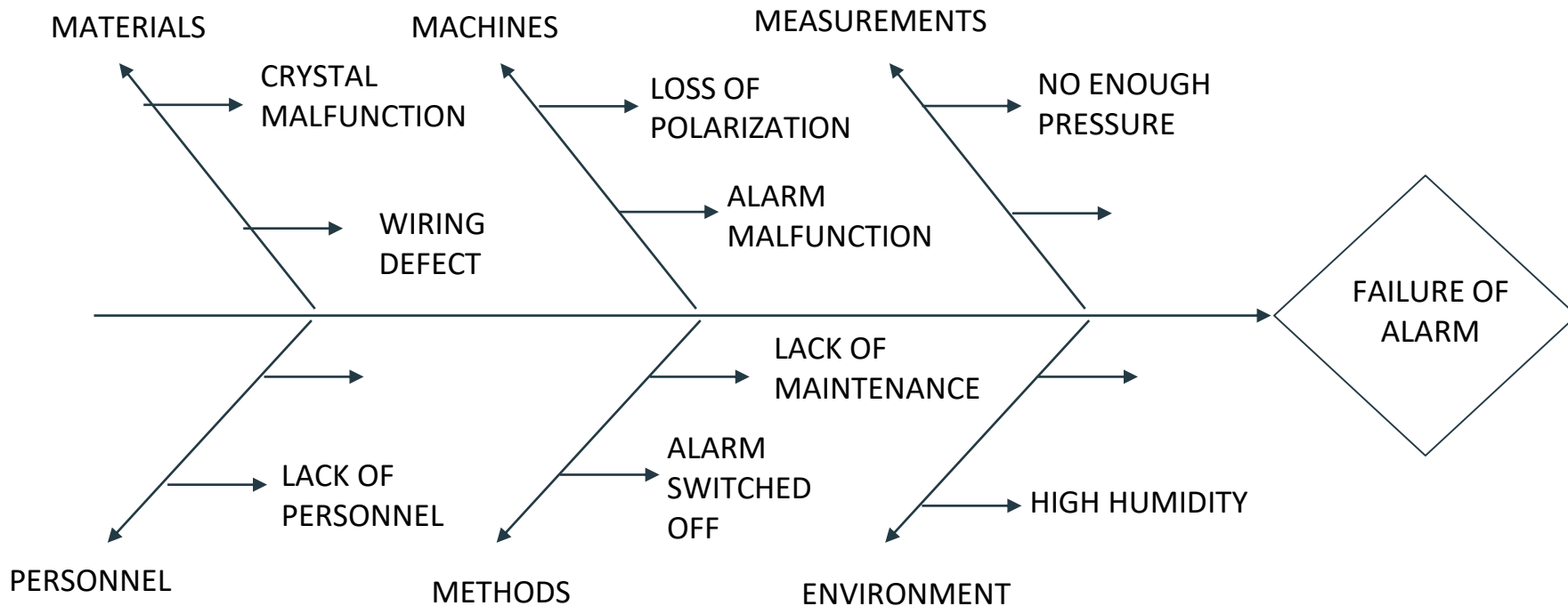
Fail Safe

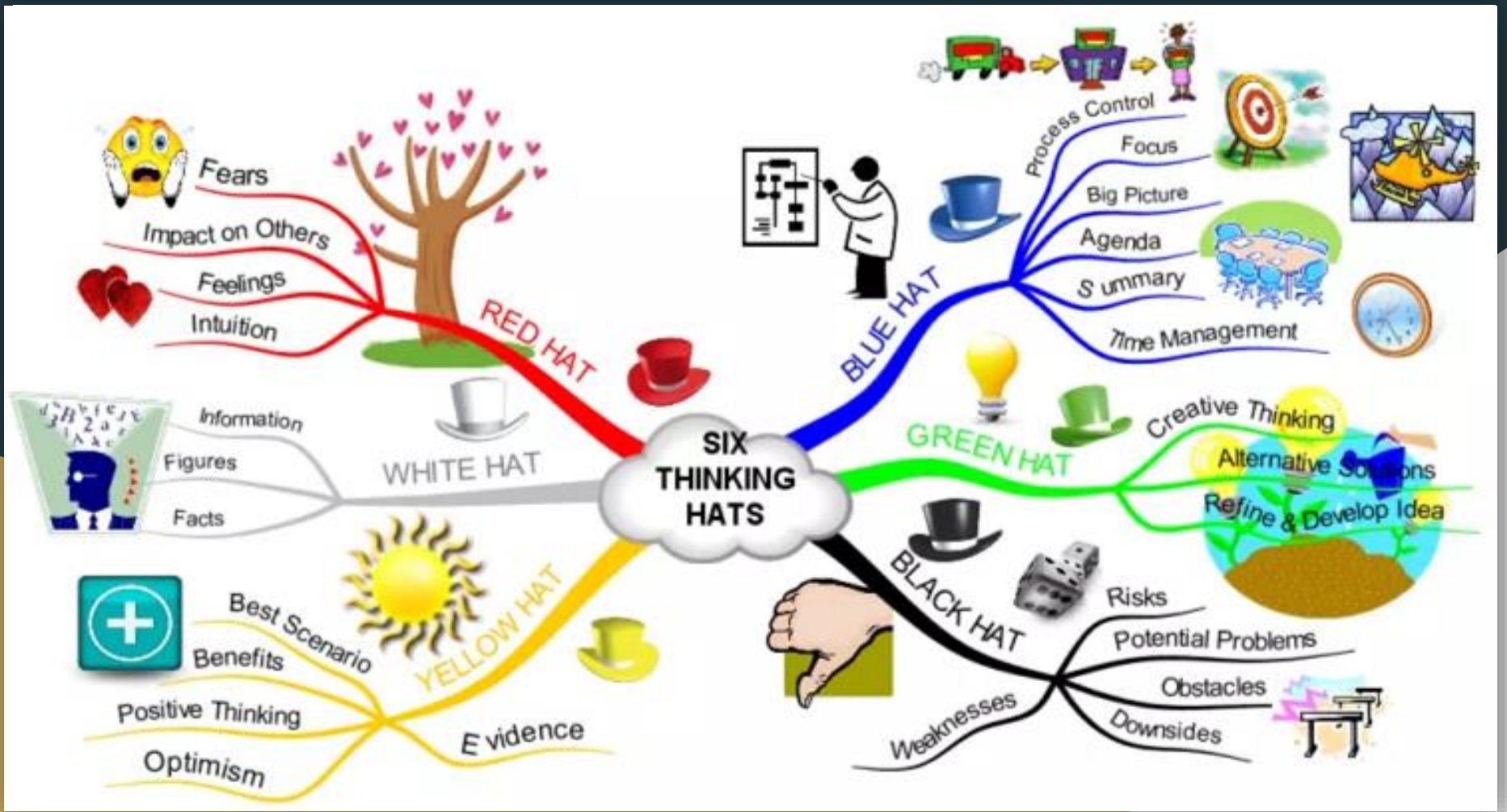
- It needs to be ensured that a human took the fall, and not a smaller object of similar density.
- Thus, the alarm will go off if a certain number of sensors get activated.
- The exact number is to be decided on the basis of the distance between the installed sensors and the people using them.

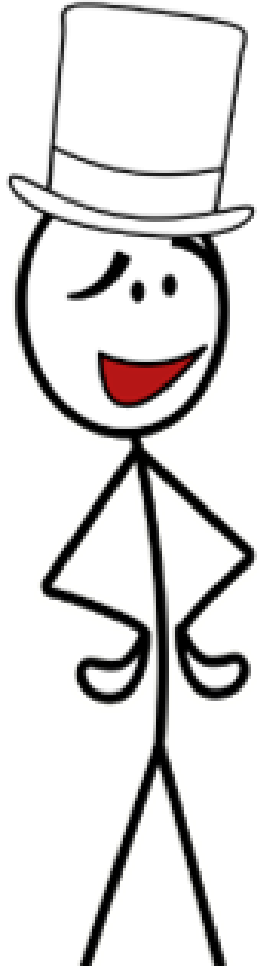
Target Customers

Households with aged people, of middle and high income class families.









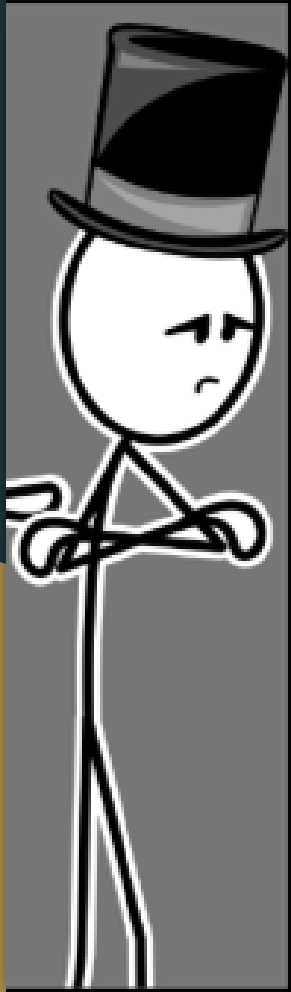
- People over 85 suffer more than half of their injuries near the toilet.
- Every year about 235,000 people in USA over age 15 visit emergency rooms due to injuries suffered in the bathroom, and almost 14 percent are hospitalized.



- May be helpful in saving some lives.
- Gives assurance to other family members in leaving elderly people alone at home.



- People are alerted immediately by the emergency alarm.
- All bathroom users, specially old people, get immediate help when they slip and fall.



- People will get limited range of tiles; thickness of tiles has to be 8mm (min.)
- There is a possibility of false alarm, which may create inconvenience.



- Use of piezoelectric sensors in tiles can help to detect the fall.
- GSM modules integrated here will help to send messages to family members.
- Buffer time of 5 seconds to switch off alarm manually in case of false alarm.



- The idea of smart tiles is a unique idea and if executed properly, would help many people, specially for elderly people living alone.
- Its a cost-effective solution.

Estimation (for a 50 sq feet bathroom)

S.No	Product	Quantity	Cost per Piece	Total
1	Tiles embedded with sensors	50	50	2500
2	Microprocessor	2	200	400
3	Alarm	1	100	100
4	GSM Module	1	500	500
5	Miscellaneous			1000
	Grand Total			4500

Thank You

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