**UNIT: INTRODUCTION TO COMPUTER SYSTEMS**

**GROUP: ELEVEN**

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**ASSIGNMENT: PROGRAMME DEVELOPMENT**

**POINT OF DISCUSSION: HOME SECURITY AUTOMATION**

**THE SCENARIO**

Security personnel are used in guarding homes and providing securities for the properties and home members. This has been or is being used by so many people but it has got so many disadvantages.

**PROBLEM ANALYSIS**

* **Risk of attack**: Security officers are at risk of attack by armed people when providing security in homes.
* **Health reasons**: In case of ill-health of a security officer, this may inconvenience provision of security as one may be away for treatment. Looking for another security officer may lead charges that were not anticipated.
* **Fatigue**: Human being are prone to fatigue after a long day’s work one may become so tired limiting the standards of security provision.
* **Corruption**: Security officers maybe corrupt. This poses a great threat to the victims as one can allow crime to be committed for selfish gains.
* Inadequate experience: Most security officers may not be well equipped with the current knowledge in security. Therefore, they may fall victims of experienced robbers for example.

**SOLUTIONS**

* To avoid risk of attack, use of CCTV cameras is more efficient and reliable as one can just monitor the happenings from a safe place.
* Use of biometrics in institutions like universities and high school is more reliable as the kits are installed permanently and one can be verified before entering the premises even if a security officer is away due to ill-health or so. CCTV cameras can still be used since footage of previous events can be retrieved and monitored.
* Computer cannot be fatigued unlike human beings, for this reason, installation of CCTV cameras is the best solution to fatigue in security officers as the cameras are active 24/7 and captures everything even if a security officer is tired to provide reliable security.
* Use of fingerprints or facial recognition is a much more transparent and integral way of verifying the right people in a place. This curbs corruption in security officers who may allow in intruders posting risk to people in these premises.
* Inexperienced security personnel maybe supplemented by use of biometrics and CCTV cameras and identification cards if necessary.

**PREFFERED SOLUTION**

1. Use of CCTV cameras

* This is because when it comes to physical security provision, CCTV cameras are reliable in every aspect especially when it comes to investigations into a crime committed. Information found is rarely tampered with.

**Possible Drawbacks**

* CCTV cameras use electricity thus in case of a black out monitoring may be a problem. Security officers may be used as a backup in this case.
* It needs an expert to do the monitoring as it involves some good knowledge in computing.
* Some substantial amount of capital is needed to purchase and install the cameras.

**DEVELOPING THE ALGORITHM**

The logical steps involved in CCTV installation are:

1. Model the area i.e. map out the area, define view range, identify obstacles.
2. Generate possible camera locations, i.e. select key points, determine visibility, mark overlap zones.
3. Optimization- initial placement, Iterative coverage check, Redundancy reduction.
4. Final validation i.e. simulate blind spots, path simulation.

FLOWCHART

START

Model the area: Create a graph representation of the area, identifying critical areas and obstacles.

END

Simulate paths within the area covered to ensure smooth monitoring without gaps.

Validate coverage: Ensure all critical zones are covered. If not re-evaluate placements.

Check for redundancy: Remove cameras where possible without losing coverage to minimize costs.

Add cameras to cover uncovered critical zones, updating covered zones after each placement.

Optimize initial placements: Place cameras are critical points and calculate coverage area.

Generate possible camera locations at critical points (entrances, exits, high-priority regions) and calculate viewable areas from each location.