A multi-sensor surveillance system for public transport environments

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PRo-active Integrated systems for Security MAnagement by Technological, Institutional and Communication Assistance

- 5th , 6th, 7th programmes of the EU (Cromatica, Prismatica, Caretaker, advisor, Securemetro, Modsafe,…)

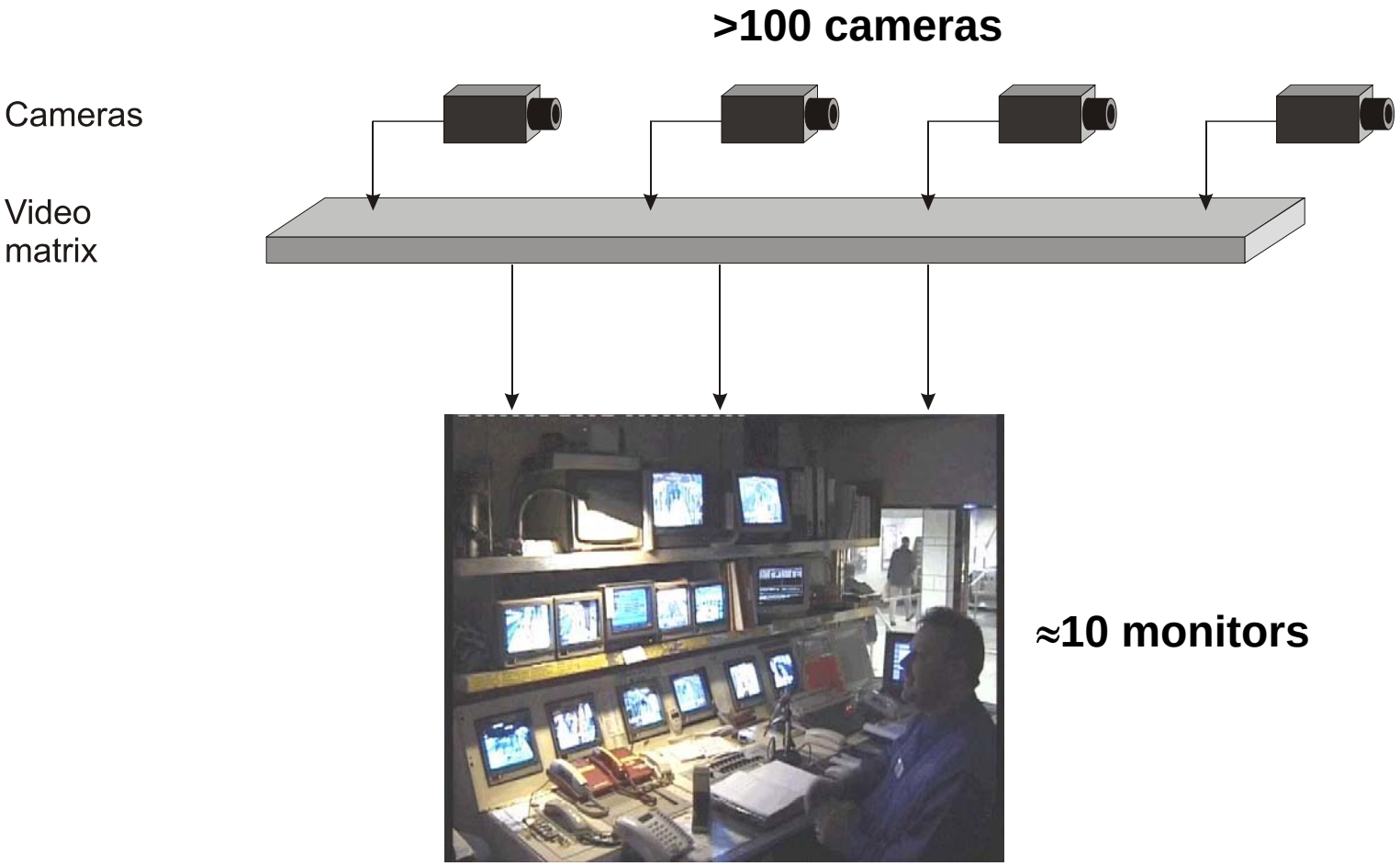
Actors

- Urban public transport operators (DB,LUL,SNCF,RATP, BAA, NIAL, …
- Industrials (Thales, Alstom, Bombardier, Siemens, CEA, …)
- Research and technology laboratories

Aim

- Develop innovative security management systems
- Contribute to make public transport more attractive and more secure

The need for automatic image and audio processing



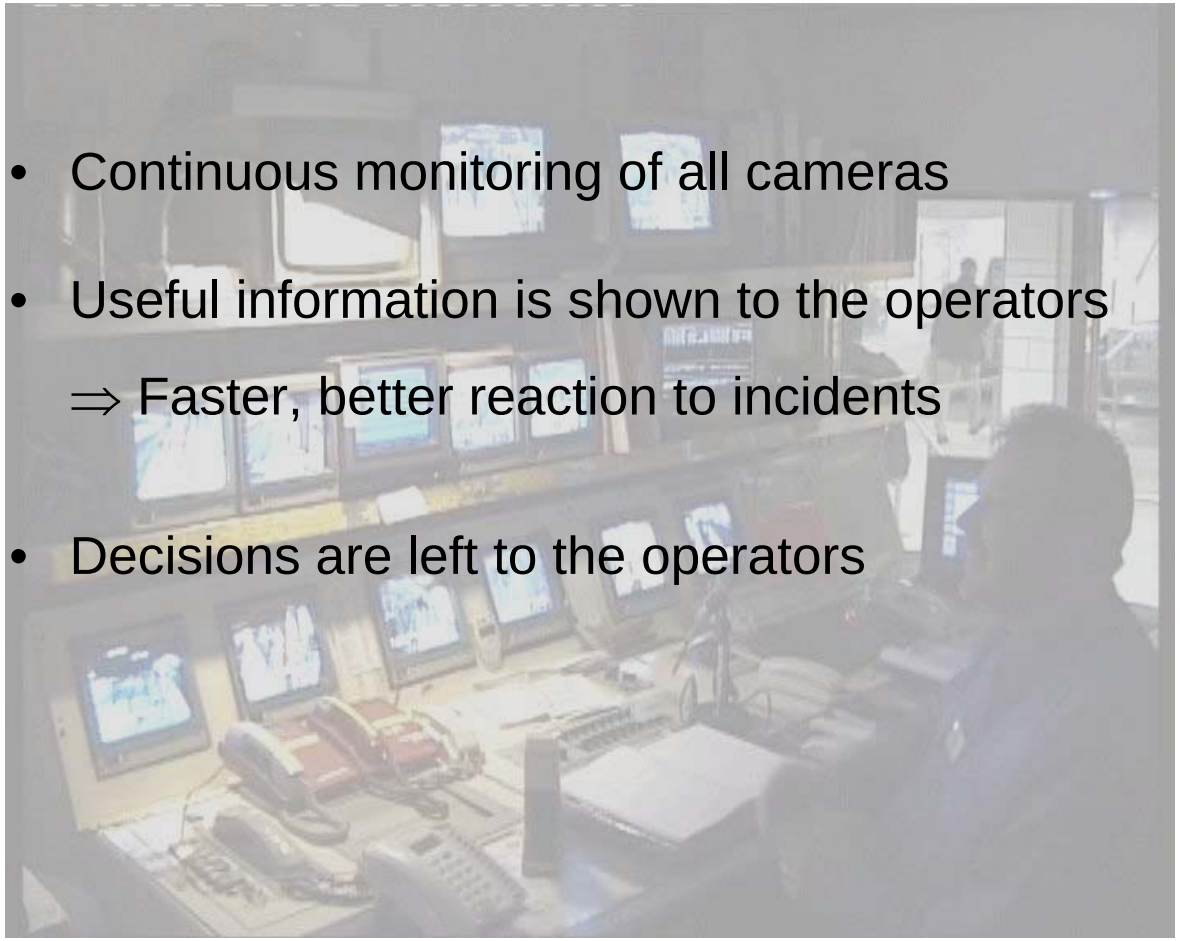
The need for automatic image processing

- Cannot watch all the cameras

  $\Rightarrow$ How to select the proper cameras ?

- Limited concentration time

The need for automatic image processing

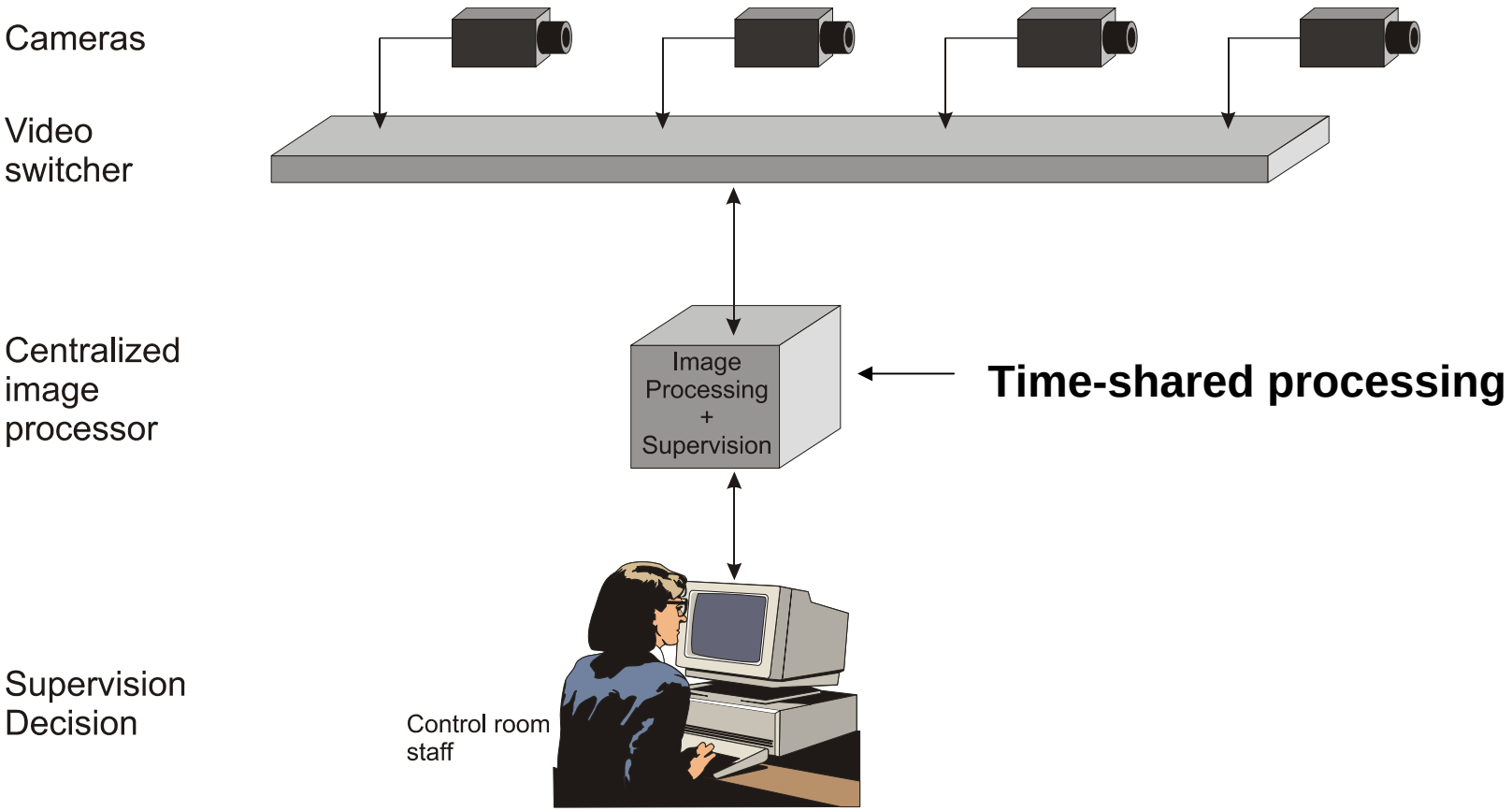


- Continuous monitoring of all cameras
- Useful information is shown to the operators

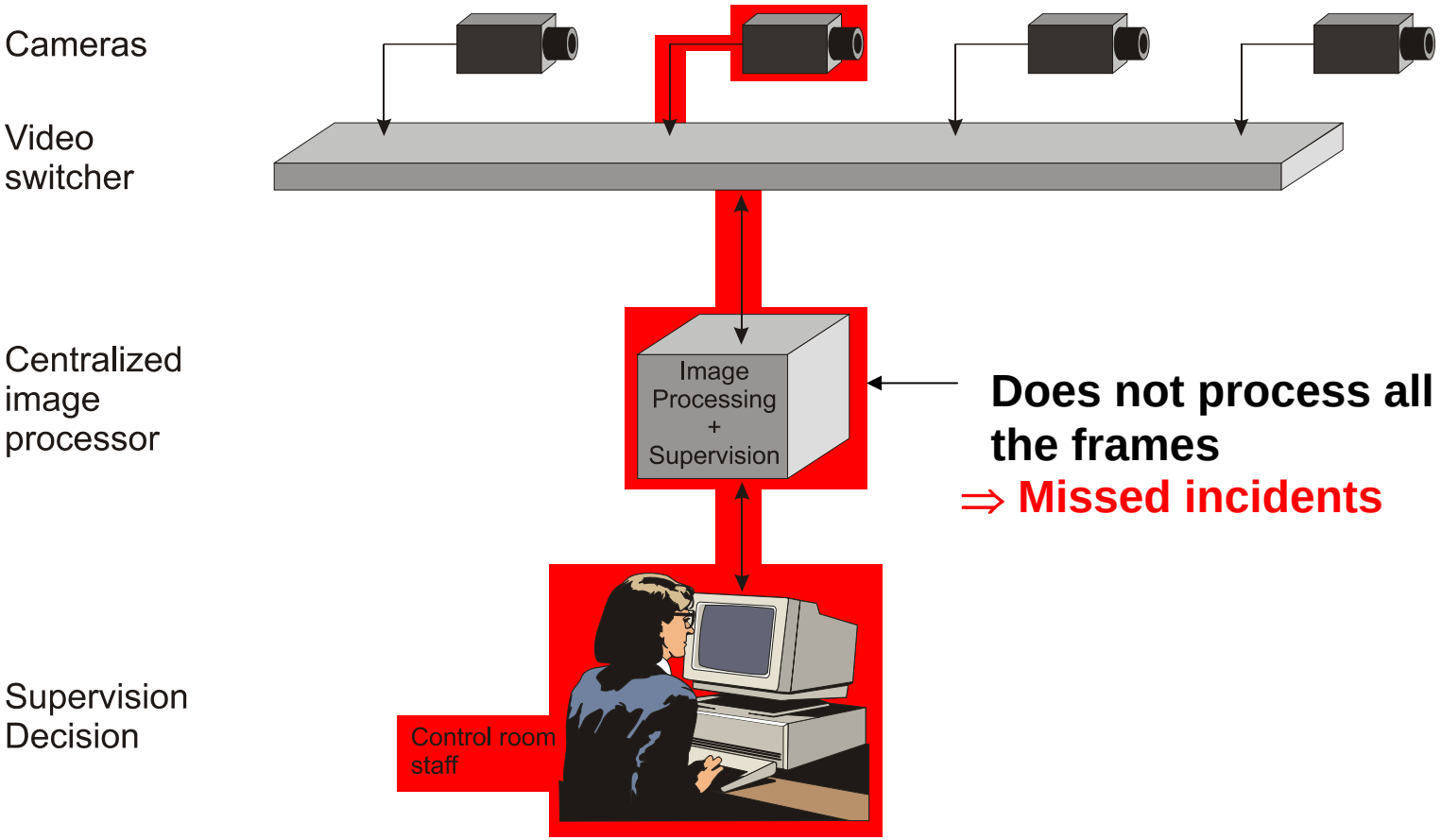
  $\Rightarrow$ Faster, better reaction to incidents

- Decisions are left to the operators

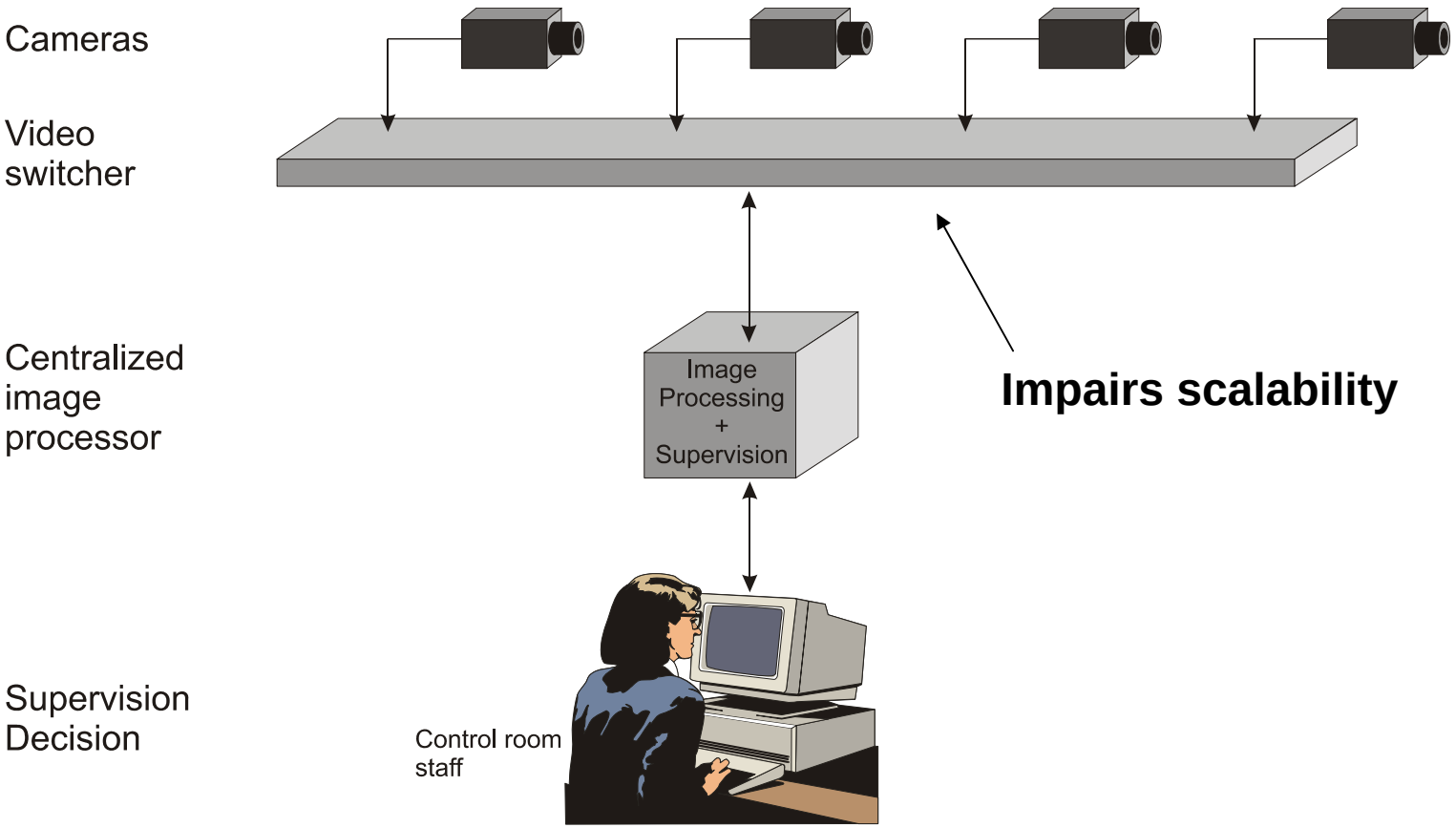
The centralized approach



The centralized approach



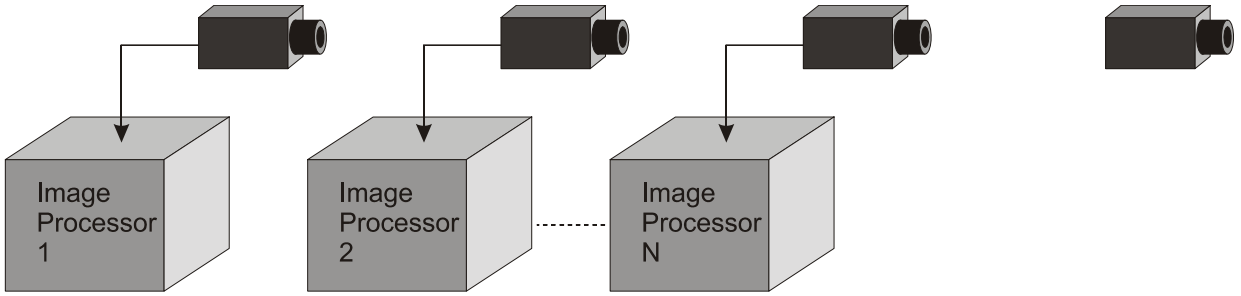
The centralized approach



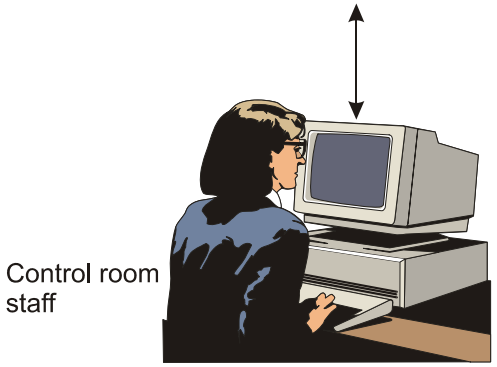
The distributed approach

Cameras

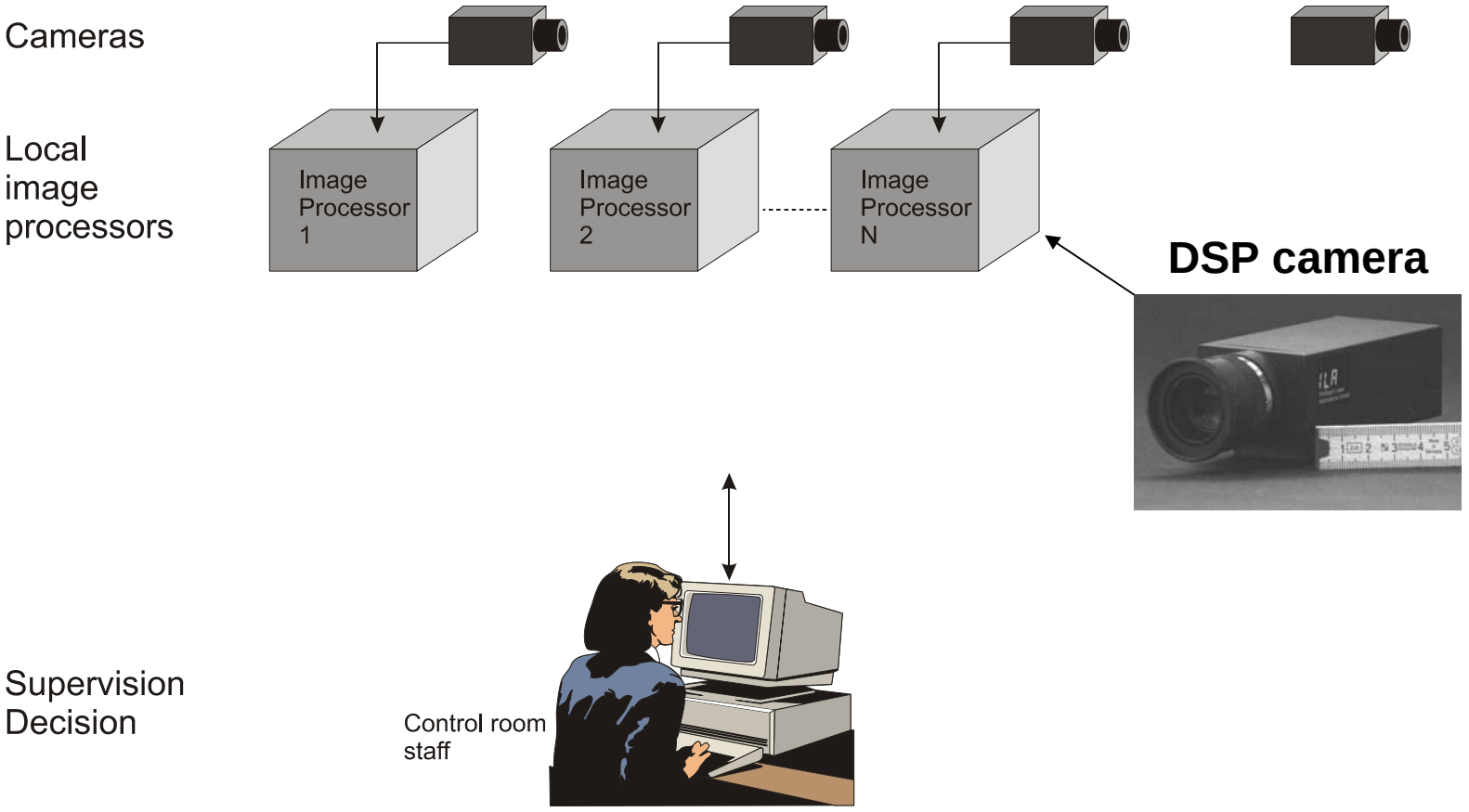
Local image processors



Supervision Decision



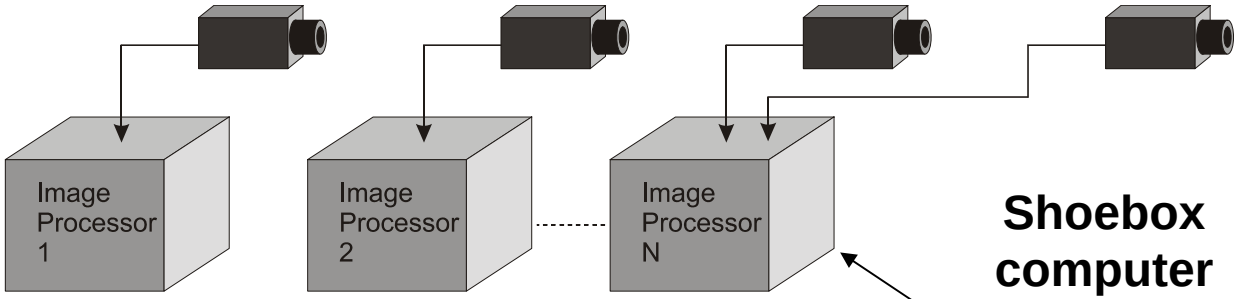
The distributed approach



The distributed approach

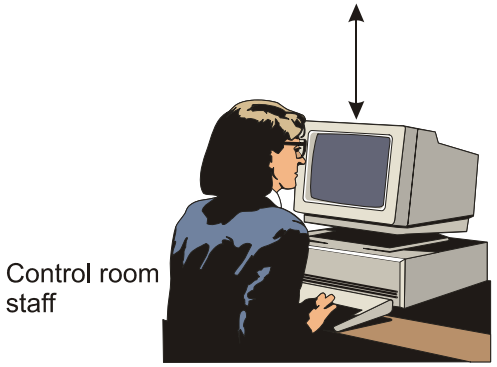
Cameras

Local image processors



Shoebox computer

Supervision Decision



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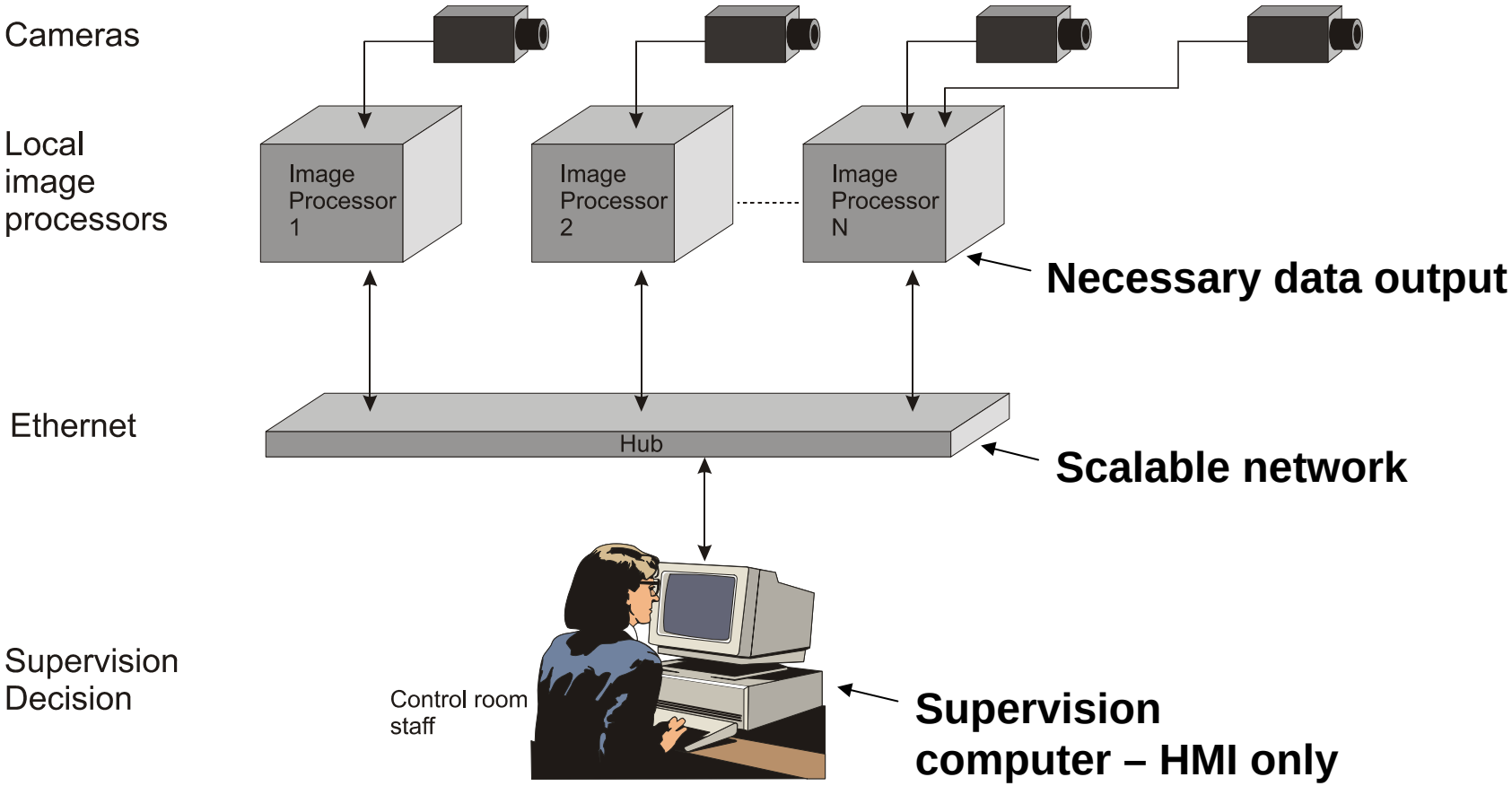

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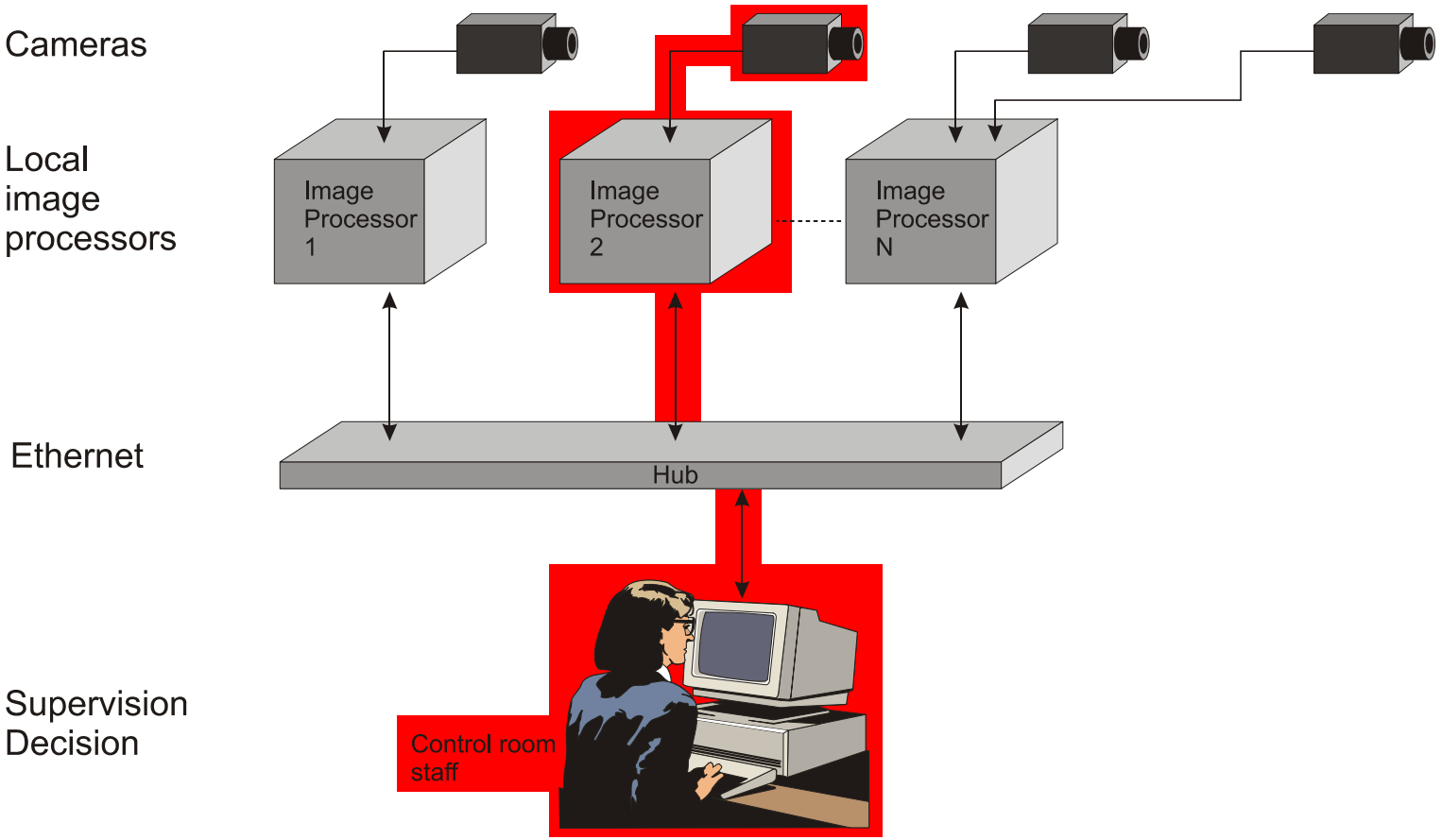

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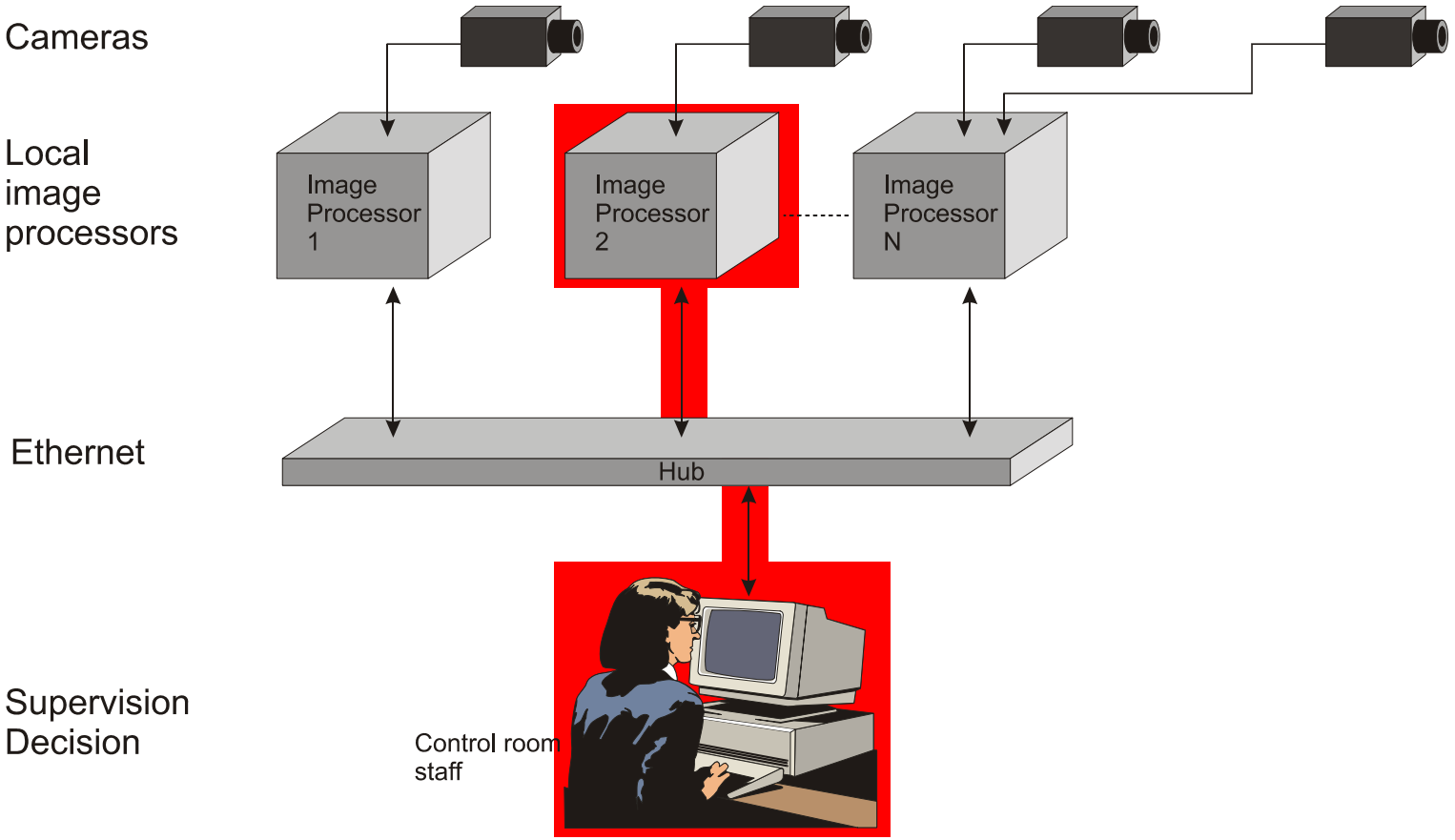


Some security applications (1)

Crowd

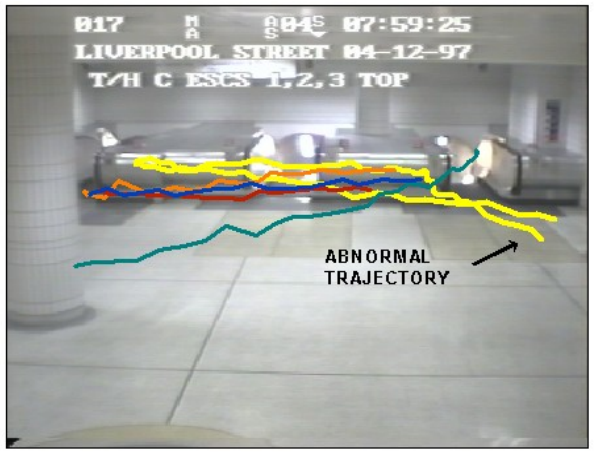
Stationary people or object left

Intrusion in forbidden areas

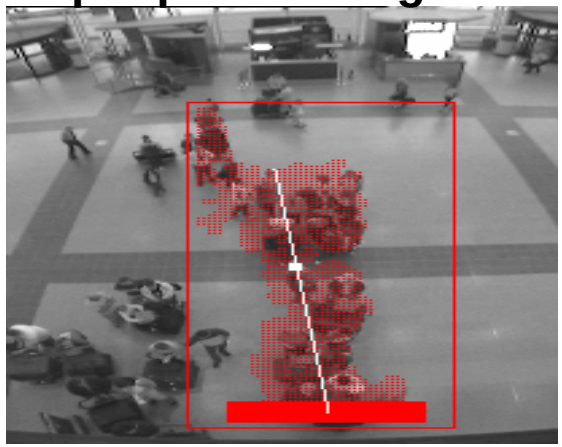
Forbidden motion

Some security applications (2)

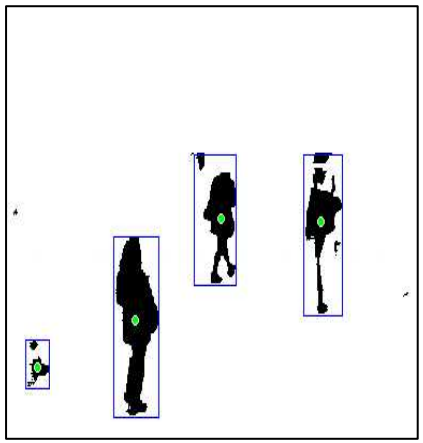
Localisation and people tracking

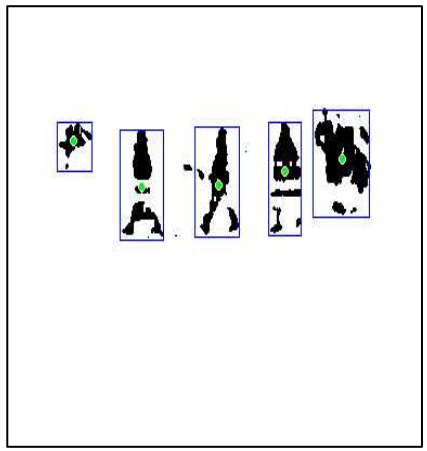


Analysis of trajectoires



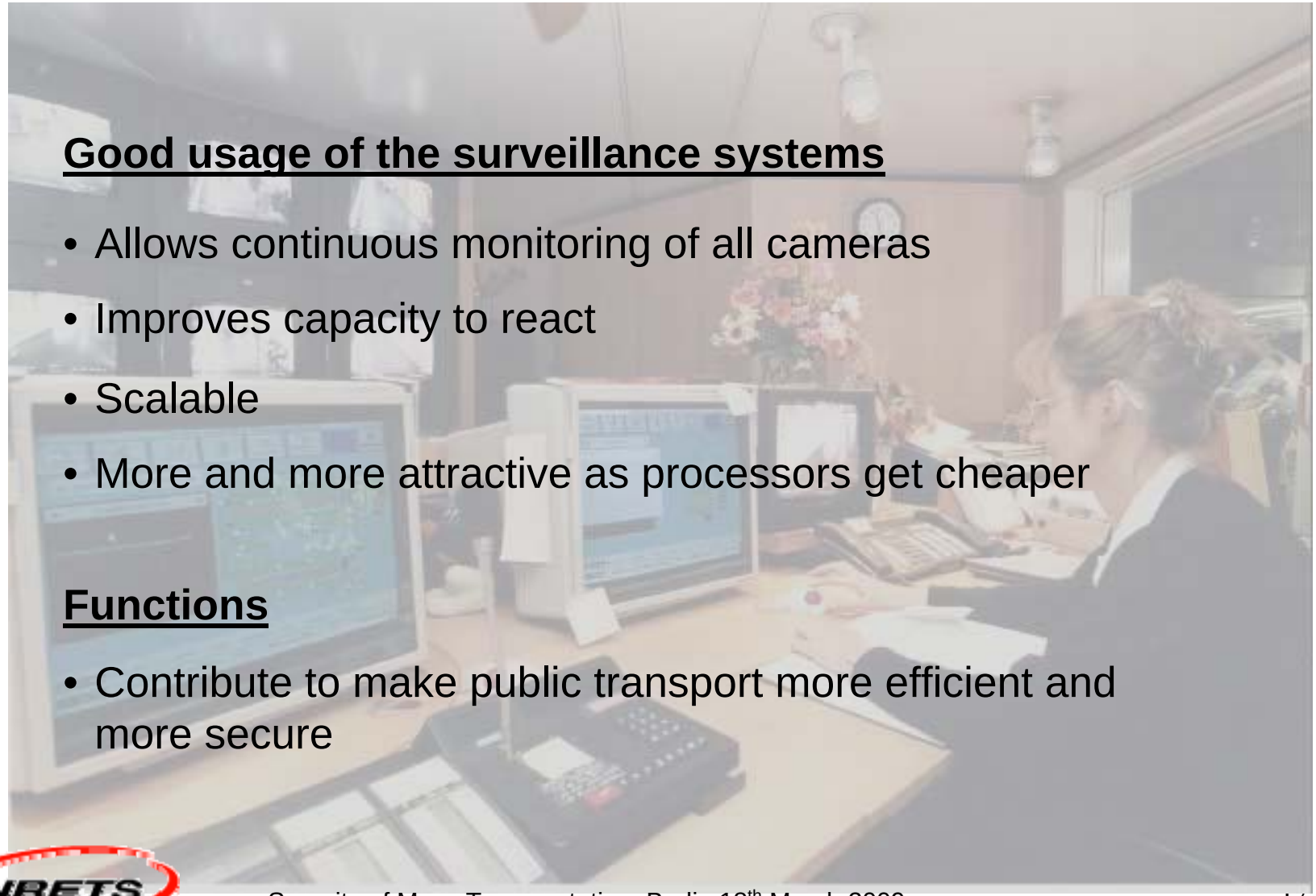
Queue length measurement





Accurate localisation

Conclusion



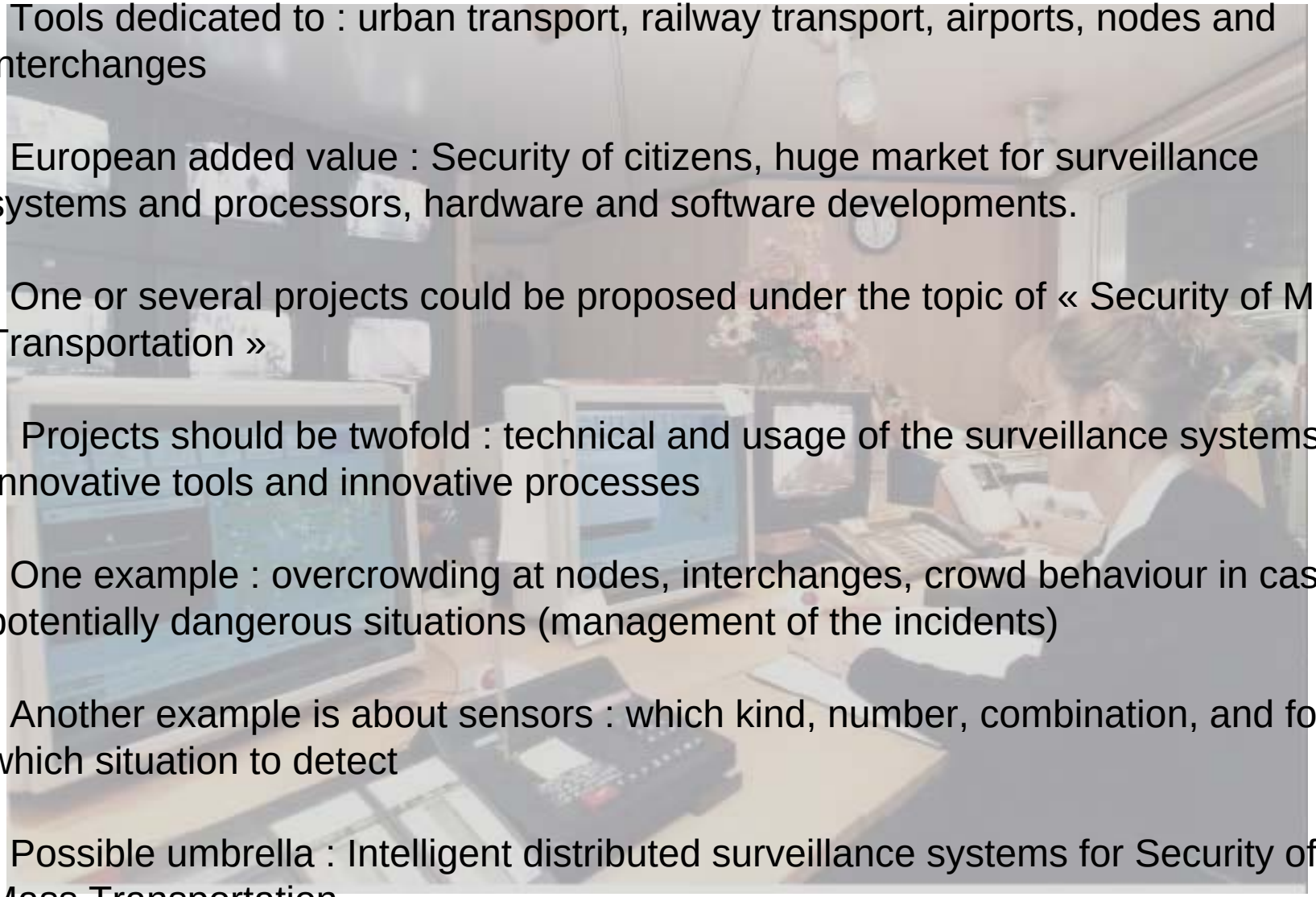
Good usage of the surveillance systems

- Allows continuous monitoring of all cameras
- Improves capacity to react
- Scalable
- More and more attractive as processors get cheaper

Functions

- Contribute to make public transport more efficient and more secure

Synthesis



• Tools dedicated to : urban transport, railway transport, airports, nodes and interchanges

• European added value : Security of citizens, huge market for surveillance systems and processors, hardware and software developments.

• One or several projects could be proposed under the topic of « Security of Mass Transportation »

• Projects should be twofold : technical and usage of the surveillance systems. Innovative tools and innovative processes

• One example : overcrowding at nodes, interchanges, crowd behaviour in case of potentially dangerous situations (management of the incidents)

• Another example is about sensors : which kind, number, combination, and for which situation to detect

• Possible umbrella : Intelligent distributed surveillance systems for Security of Mass Transportation

- **Full scale demonstrations and testing**
- **Some minor demonstrations have been implemented at RATP for instance**
- **Some additional detections functions are ready to be implemented in life situations**
- **Some of them are in progress**