Automated Diagnostics

Need for Performance Monitoring and Diagnostics

- most buildings perform significantly below technical potential
- control systems – problem and answer

Need for automation:

- lack of skilled commissioning technicians and building operators
- reduce costs

Goal: develop and deploy automated diagnostic tools for principal building systems

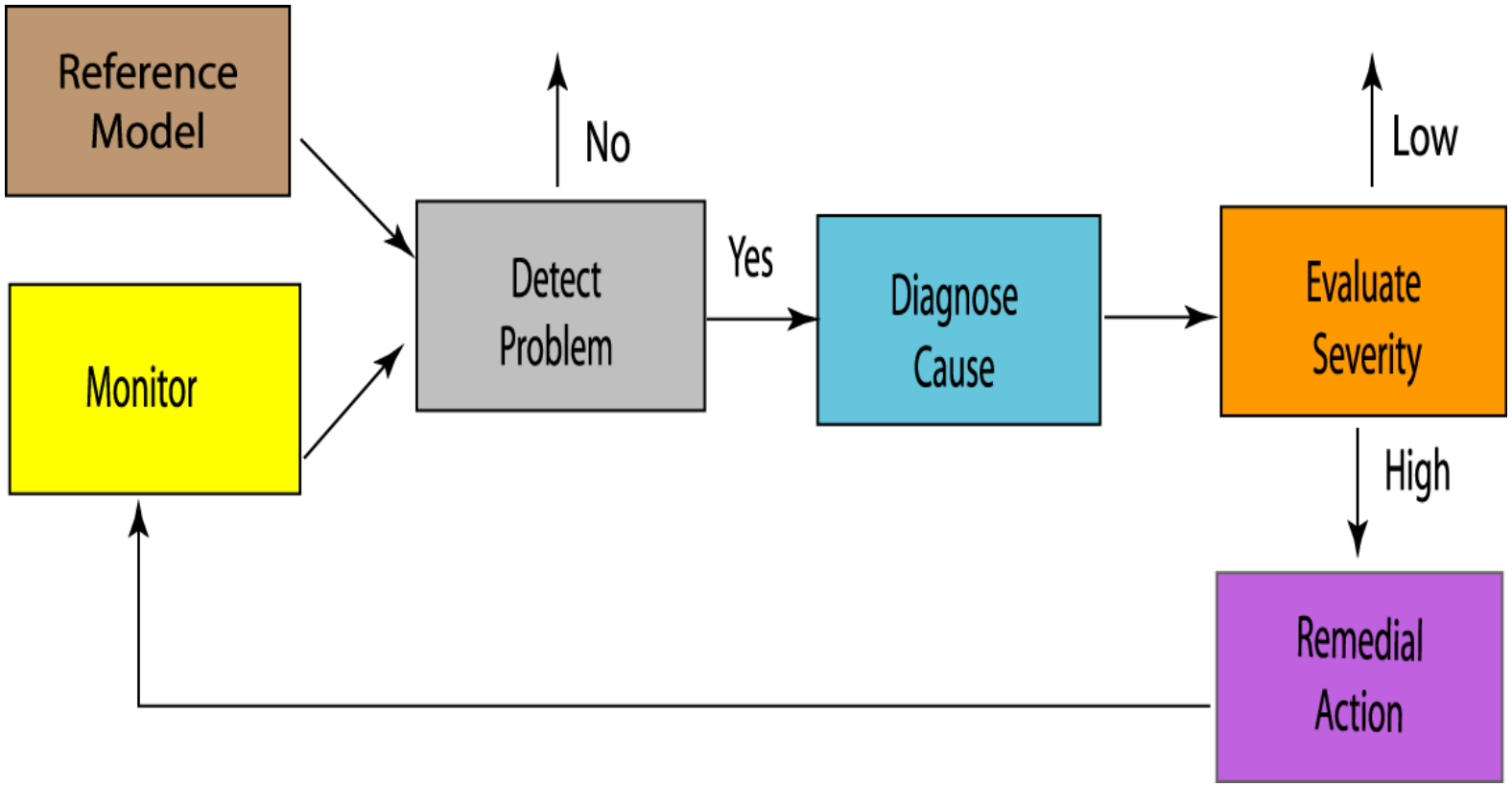
Integrated Approach

Design
- configure model with design information

Commissioning
- verify performance during functional testing
- fine tune model using functional test data

Operation
- use model for online performance monitoring

Model-based Automated Diagnostics and Prognostics



Commercialization Paths - I

- Broad consensus that automated diagnostics has both technical and market potential
- Greatest potential:
  - Economies of scale: large buildings, campuses, chains
  - Energy intensity: central plants, labs, fabs
- Main technical/cost barrier: extracting data from controls
- Main market barriers:
  - Lack of commercial products
  - Lack of information on costs and benefits
- Controls vendors are ‘natural’ implementers at system level, but only because of easier access to data

Commercialization Paths - II

- R&D needs:
  - Standards for data transfer to 3rd party tools (ASHRAE?)
  - Develop diagnostic methods for conventional systems (HVAC and whole building)
  - Work with owners and manufacturers to:
    - Understand practical needs
    - Demonstrate technical potential
    - Determine and disseminate costs and benefits