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Automated On-Line IAQ Reporting System

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Agenda

- The Problem
- Background
- The Design Criteria
- The Automated IAQ Software
- Parts of the System
- Data Collection Continuum
- Database
- Rule set
- Reports
- Benefits

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The Problem

- There are lots of instruments to measure the components of air
- One can easily and accurately measure these components
- The ***real problem*** is understanding what these measurements mean
- The automated analysis of appropriate air measurements is the problem we have addressed

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Background

- We investigated proven IAQ measuring & analysis techniques and systems
- We analyzed the IAQ systems to see what could be automated
- We partnered with a leading IAQ consulting firm and developed the

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Design Criteria

- Measurements and observations to be maintained in a database
- Fast report generation
- Historical measurement/observation database
- Reports on demand (on-line)
- Integration of energy management programs
- Access to data and reports via the Internet

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The Automated IAQ System

- Measurements and observations are made
- The information is stored in a *database*
- An **inference engine** is supplied with the appropriate "*rule set*"
- The information from the database is analyzed by the "*engine*"
- A report is generated

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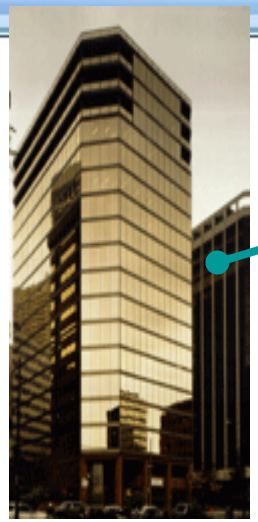

Measurements &
observations taken

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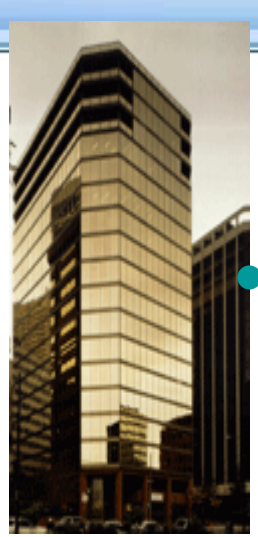

Measurements & observations taken

Data sent to central server database

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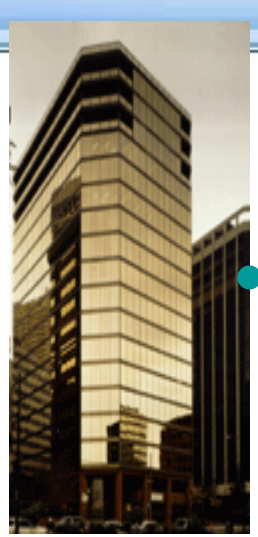
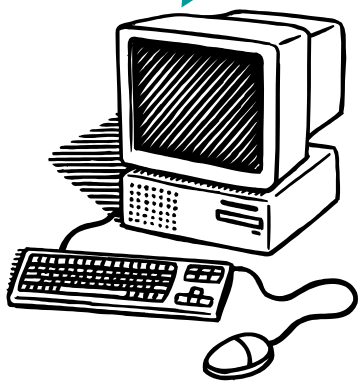


Measurements & observations taken

Data sent to central server database

Data extracted for the building



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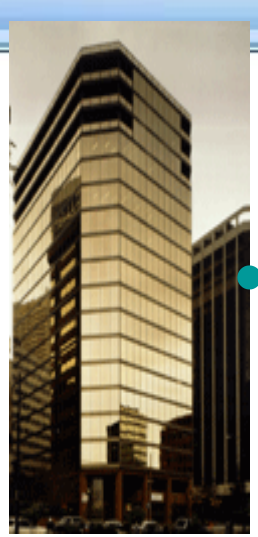
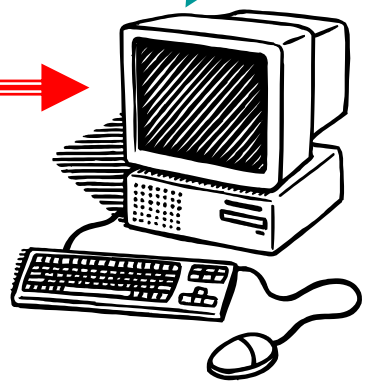


Measurements & observations taken

Data sent to central server database

Data extracted for the building

The "rule set" Applied for the building



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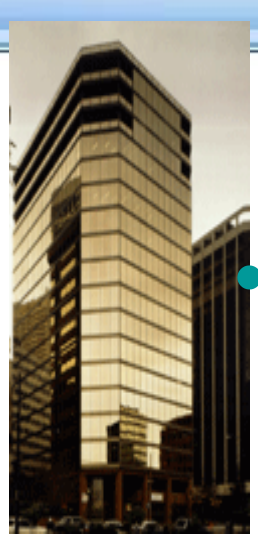

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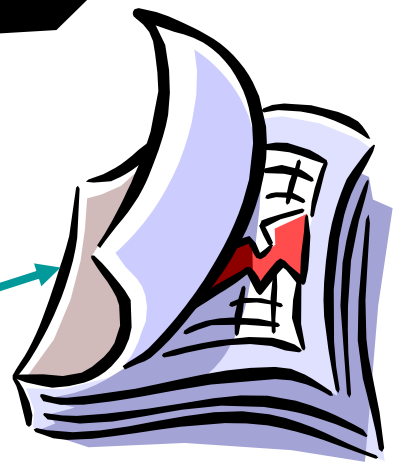
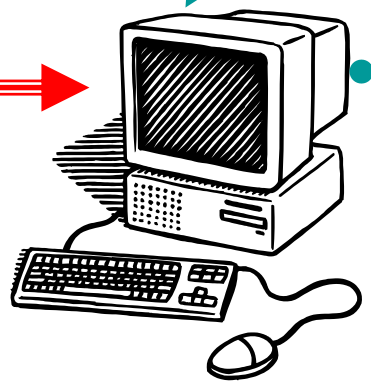


The reports are generated

The "rule set" Applied for the building



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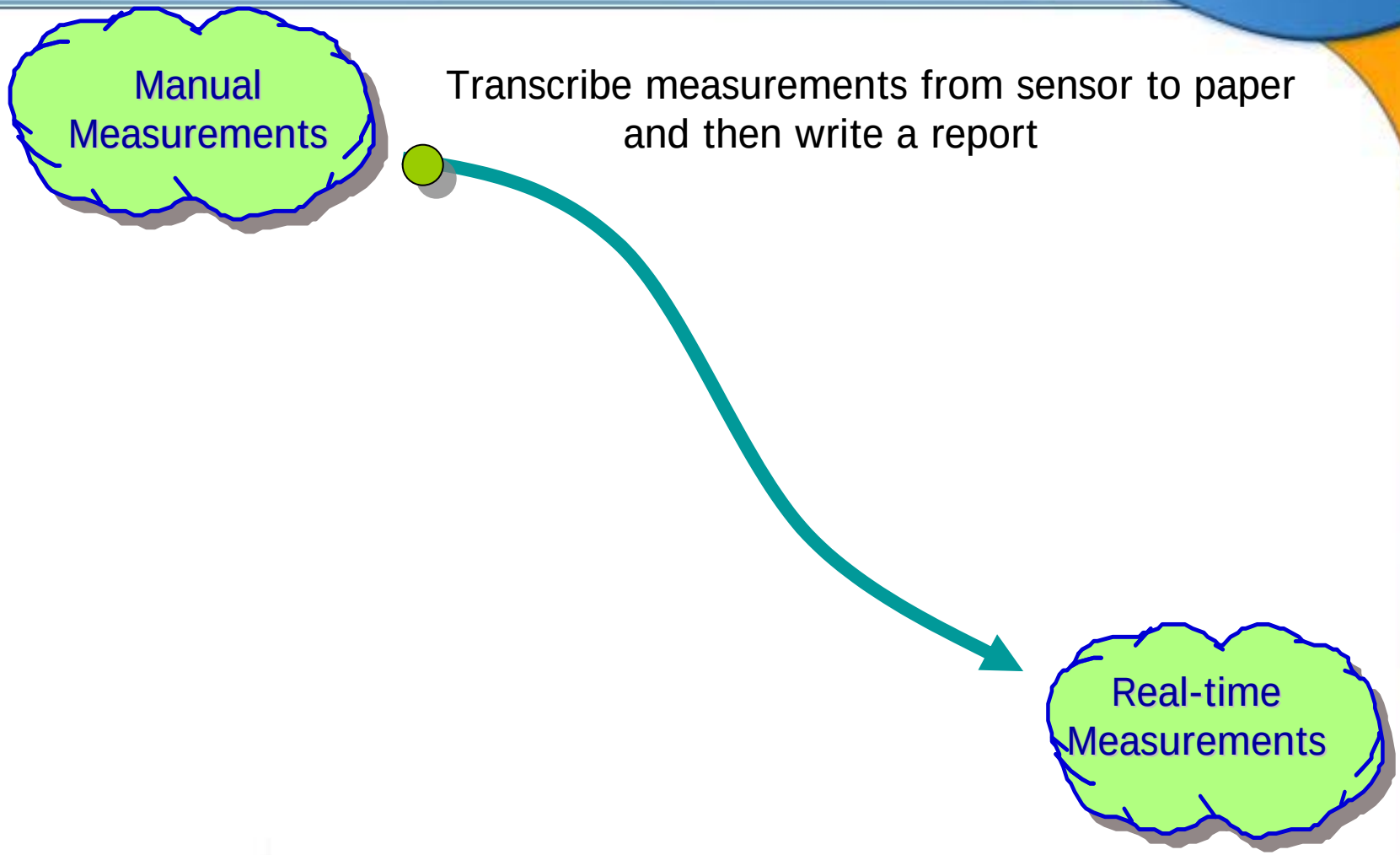
Parts of the System

- Measurements are taken using the appropriate sensor technologies
- Observations are made and pictures/drawings are taken where necessary
- The database contains all the recorded data
- The “inference engine”, using the rule set then reads the database and applies the rules
- The findings and conclusions are generated

  on-line-printed report/on-line alarm system

Data Collection & Reporting Continuum



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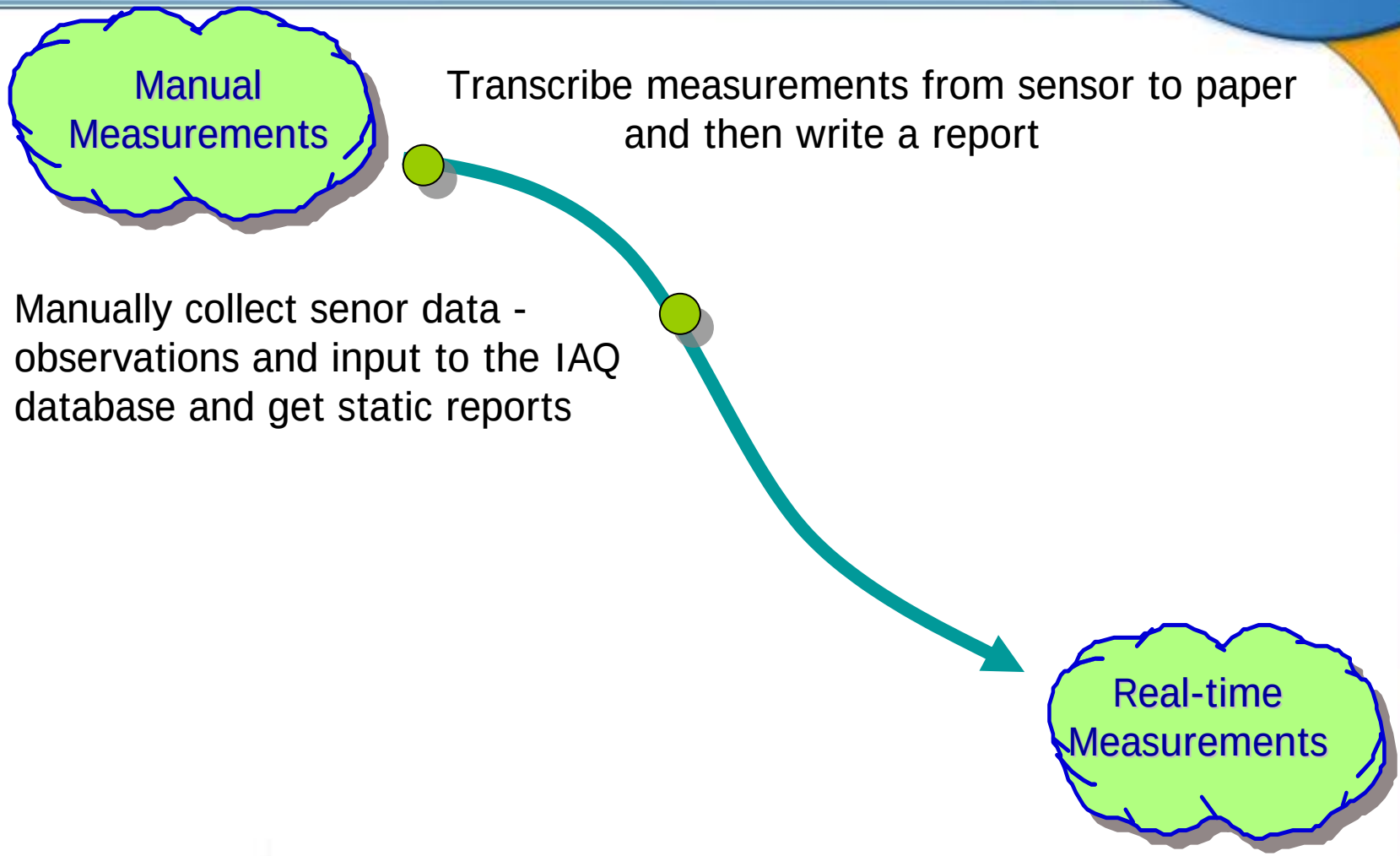
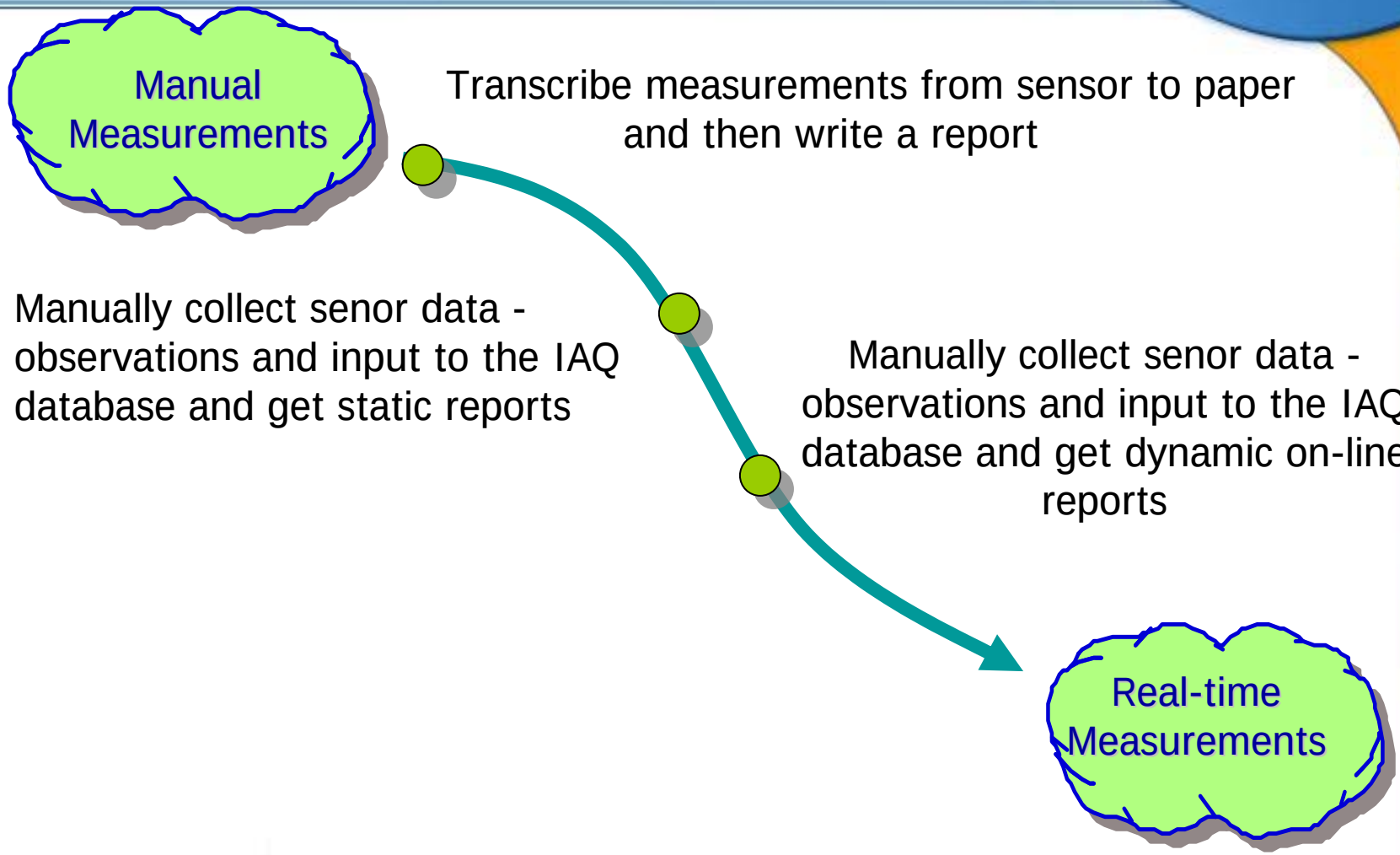


Data Collection & Reporting Continuum



Data Collection & Reporting Continuum

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Manual Measurements

Transcribe measurements from sensor to paper and then write a report

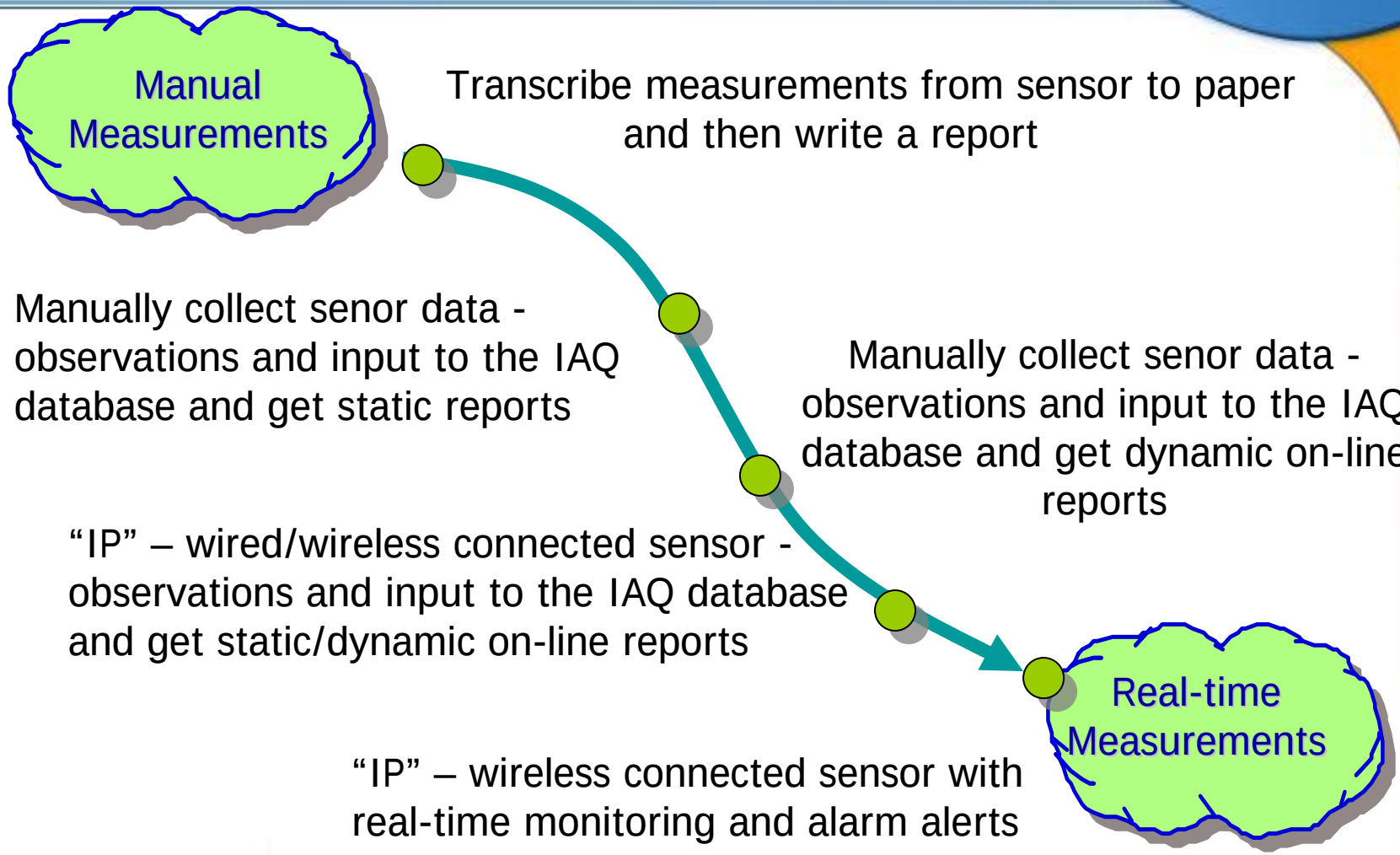
Manually collect senor data - observations and input to the IAQ database and get static reports

Manually collect senor data - observations and input to the IAQ database and get dynamic on-line reports

"IP" – wired/wireless connected sensor - observations and input to the IAQ database and get static/dynamic on-line reports

Real-time Measurements

Data Collection & Reporting Continuum



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The Database

Maintains data files:

- Buildings
- Jobs
- Measurements
- Observations (pictures, etc.)

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The “Rule Set”

- The Heart of the system
- The “rules” are continually updated
  - New regulations
  - Scientific – industry reports
  - Conclusions
  - Techniques
- Regional differences
- Indoor/outdoor variances
- Report styles

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The Reports

- The reports are ***static***:
  - Printed and/or
  - On-line (web based)
- The system can be on-line, real-time activated then the reports are ***dynamic***:
  - Dynamic (web based)
  - With e-mail/cell phone alerts
  - And the data can be fed into a demand control ventilation (DCV) system model

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Key Benefits

- *Customization* of the system for client needs
- *Historical – comparison* IAQ database
- Report *depth* (on-line hypertext)
- *Standardized* system of IAQ checking across the regions
- Ability to *integrate* various energy management models

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Thank You