Chemical inventories: What are they good for?

Ralph Stuart
Chemical Hygiene Officer, Keene State College

Keene STATE COLLEGE

Wisdom to make a difference.

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My History with Chemical Inventories

UVM (start-up)

- 1985: OSHA'S Hazard Communication Standard
- 1990: Hazmat Planning Reporting Requirements
- 1997: Lab-XL regulatory reinvention around lab waste

Cornell (expansion)

- The Chemistry Department (20% of campus) had established a centralized inventory
- We tried to expand the scope of this program to include the rest of the Ithaca campus

Keene State College (adapting to)

- UNH CEMS was an established program when I arrived.

Why an Lab Chemical Inventory?

Laboratory Best Practices

- Maintain quality information about experimental materials
- Provide funders with appropriate business oversight
- Control banding for lab safety support programs

Regulatory Concerns

- Municipal code compliance for facility planning and operations
- EPCRA (SARA Title III Section 313)
- Department of Homeland Security - Chemical Facility Anti-Terrorism Standards
- OSHA Hazard Communication requirements
- OSHA Laboratory Safety Standard
- Clean Air Act reporting requirements
- Toxic Substances Control Act

Lab Chemical Inventories as an Information Use Case

The Data of Interest:

- What is the Chemical?
- Where is It?
- Whose is it?
- When is it there?

Not of interest for inventory purposes

- How will it be used?
- Why do we have it?

A wide variety of interesting **reports for many different stakeholders** can be generated from this data.

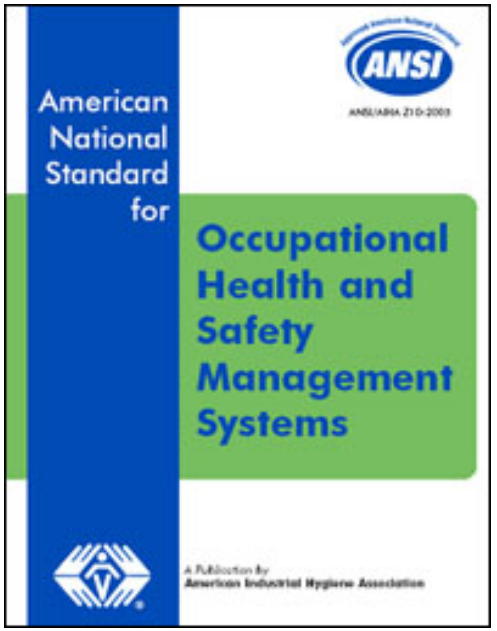
Unfortunately, while information may want to be free, **collecting and managing data streams is not free.** Sustainable resources are required to support them.

Business Characteristics of the Academic Lab Environment

- **Multiple, complex funding sources** that are often disconnected from the work at hand
- **Very low overhead rates** compared to similar work done on a commercial basis
- **Very low labor costs** compared to similar work done in private settings (but the labor costs are still much higher than the chemical costs)
- High labor turnover creates **significant training and oversight costs**
- **Legacy facilities and bureaucracies** limit the options available to support academic research

Managing Within Systems

- Management systems involve a variety of stakeholders with different priorities
- Systems can be **complicated** (change results in a predictable outcome) or **complex** (a change results in a variety of outcomes, some predictable., others not)
- Laboratory management faces **competing priorities** (evolving science, changing safety expectations, and organizational sustainability)
- ANSI Z10 provides schematic outline for approaching complex systems



Key Elements of an ANSI Z10 Management System

- Definition of Stakeholder Roles and Responsibilities
- Identification of Key Indicators to track progress towards **continuous improvement** rather achieving an end goal

Big Question 1:
Who is a Chemical Inventory For?

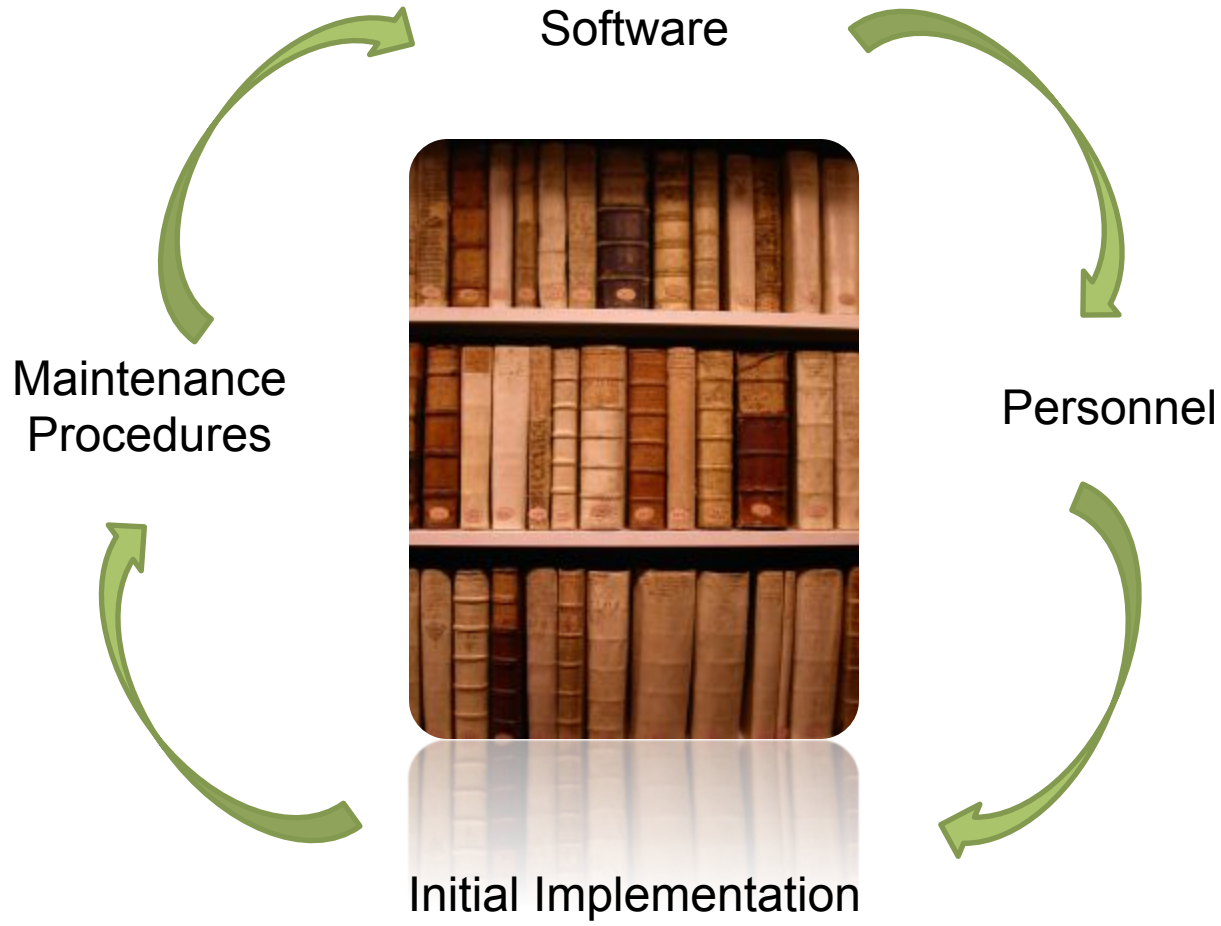
Stakeholders

- Lab personnel
- Lab managers
- Emergency Planners
- Facility Planners
- EHS lab safety support staff
- Facilities staff for energy conservation program

Big Question 2:
How Do We Know if It's Working?

- **Plan:** Identification of tools, people and money needed to implement the program **(leading)**
- **Do:** Percent of labs participating *(compared to the target; don't set 100% as the target)* **(leading)**
- **Check:** Accuracy of information in the system *(compared to the target; don't set 100% as the target)* **(lagging)**
- **React:** Reports about the use of information to support better science **(lagging)**

The Nitty-Gritty Questions



Defining the Chemical Inventory Universe

Scope of the Program

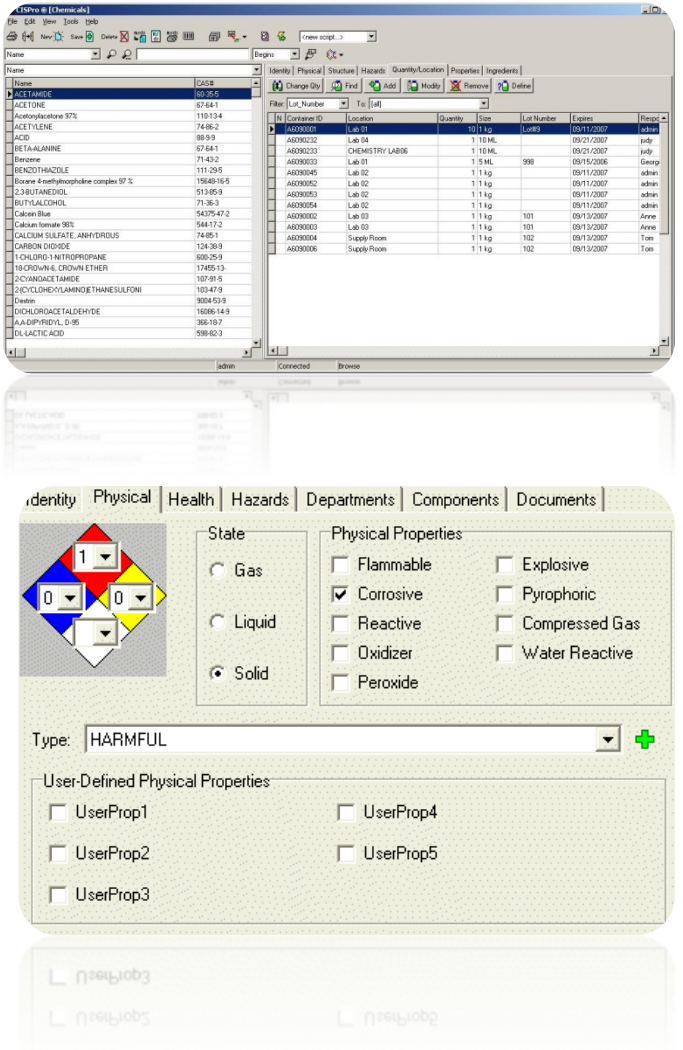
- All chemicals?
- Hazardous chemicals?
- On a room by room basis?
- Lab by lab?
- Shelf by shelf?

Organizing Principles

- By location
- By owner
- By user
- By grant

The Software Question

- **Chemical Inventory Systems**
  - Software that tracks chemical products and their locations on campus
  - Create reports that satisfy regulatory needs
  - Assist in overall inventory management for both lab and administrators
- Systems are built on a different platform with different priorities; these factors impact the success of the program at a specific campus.



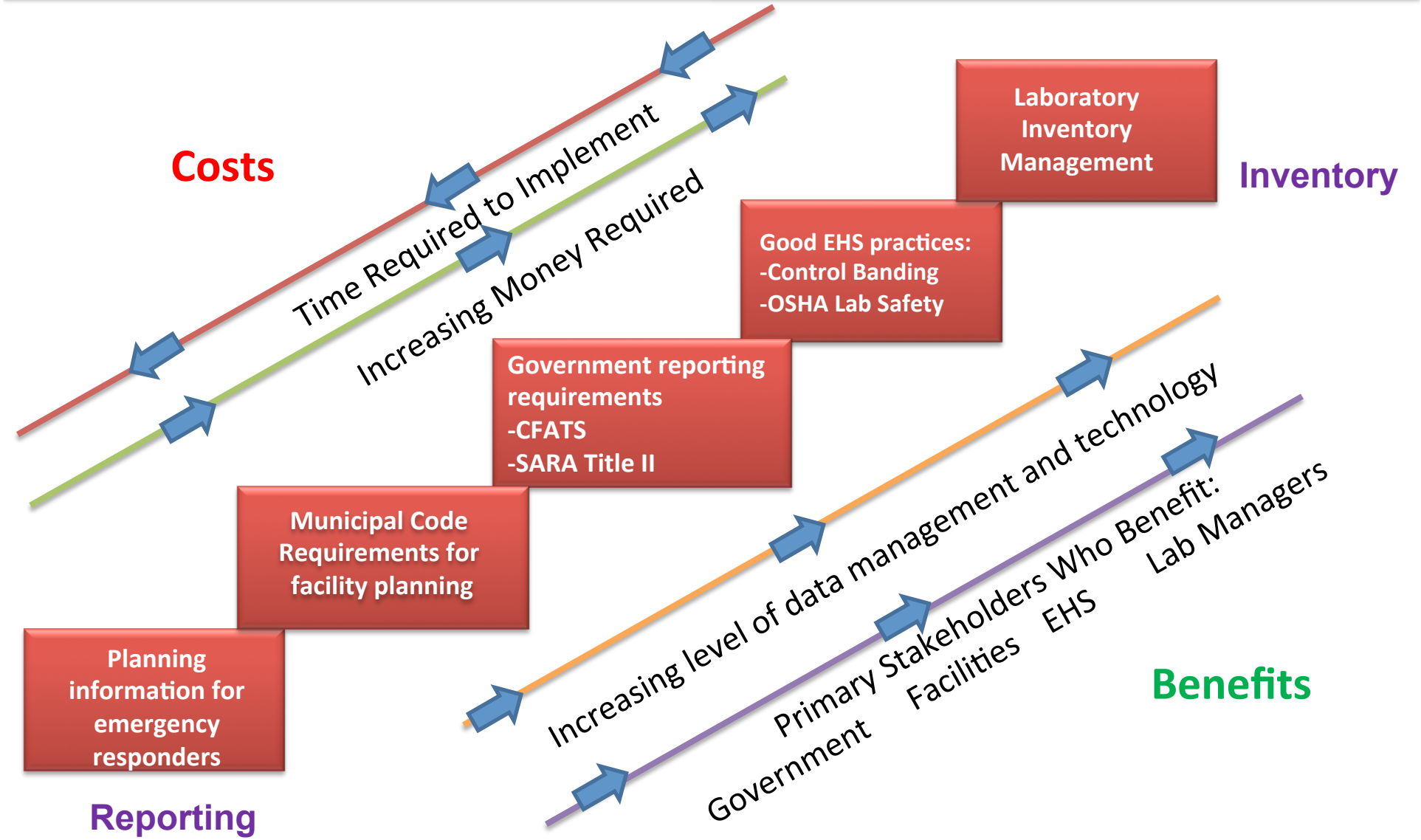
Is There a State of the Art?

- **Various approaches have been taken:**
  - Internal systems
  - Market-based systems
  - Developing and sharing their own systems
- **Centralized vs. Non-Centralized**
- **No "cookie cutter" approach**
- **Elements of success**
  - Transferability
  - Scalability
  - Sustainability (including training and oversight costs)

A Two Stage Process

- **Two major aspects of implementing a system**
  - Initial implementation of administrative support (e.g., identifying software and personnel resources)
  - On-going inventory maintenance: barcoding into an existing system, physical reconciliation of computer and reality

The Bottom Line: Resources



Questions