

Single Infrastructure Integrated Management Systems, The Future of EMS

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Abstract: As the economy slows this year, and businesses face tough choices in reducing costs, will the growth of Environmental Management Systems (EMS) implementation suffer? The cost to develop, implement, operate and maintain multiple management systems could prove to be prohibitive. Competitive pressures in the market place will continue to drive cost control efforts. In addition, more organizations are positioning to leverage the technological advantages of the "new commerce" driven by the Internet. The new business model of Next Generation Enterprises (NGE) will require interconnectivity of management systems across many organizations. All of these issues present significant challenges to Certified Hazardous Materials Managers. To meet these challenges in the new century, there is a need to integrate all management systems within an organization into a single infrastructure. The end result of this activity will make environmental aspects an integral part of an organization's business plan and an asset rather than a liability while reducing overall operating costs.

The purpose of this paper is to define the various management systems currently implemented by organizations such as quality, human relations, financial and marketing along with environmental, health and safety. Areas of opportunity for integration such as overlaps, redundancies and conflict resolution will be identified. Current business trends such as Next Generation Enterprises and Enterprise Resource Planning (ERP) will be examined for the impact on management system implementation, operation and maintenance. A model integrated management system to incorporate key aspects of business management requirements will be developed and evaluated for the benefits provided to the overall organization and in particular to its environmental aspects.

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Management Systems Basics

Before we can discuss management systems, we must understand their purpose and basic elements in a generic sense. To put it simply, a management system is a tool used by organizations to obtain consistent, measurable results and provide a method for continual improvement.

In the past decade numerous management theories have evolved and been adopted by the worlds leading corporations. These theories include Demming's Total Quality Management (TQM), the International Standards Organizations ISO 90001 Quality Management System (QMS) and the Corporate Maturity Model (CMM).

Though different in their approach, they all have several points in common. Using an ISO model these points are:

- Upper Management Commitment
- Policy Documentation
- Maintain Requirements
- Identify Aspects and Impacts
- Set Targets and Goals
- Establish Performance Metrics
- Audit the Management System
- Take Corrective Actions

Creating a system that incorporates these points ensures consistent and successful organizational performance.

Definitions

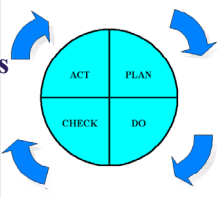
- INFRASTRUCTURE
- Quality Management System (QMS)
- Next Generation Enterprise (NGE)
- Enterprise Resource Planning (ERP)

What in the World do these things have to do with EMS?

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Management System Theory

- Management Commitment
- Policy Documentation
- Maintain Requirements
- Aspects, Impacts, Targets and Goals
- Performance Metrics
- PDCA



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Modern management systems are built on a continual improvement process model. The continual improvement of processes consists of a cycle of four steps, Plan, Do, Check, Act.

This is commonly referred to as the PDCA cycle (Figure 1). The first step of the process is to plan the task or missions, taking into account variables in the process, decision points along the process flow, resource requirements and assessing risks. The next step is to "do" or implement the plan. Once the plan is operational, a series of checks or audits are completed to evaluate the effectiveness of performance. The results of these checks are then evaluated and corrective action is taken to adjust the plan to improve performance. The cycle begins again as the plan is updated and evaluated.

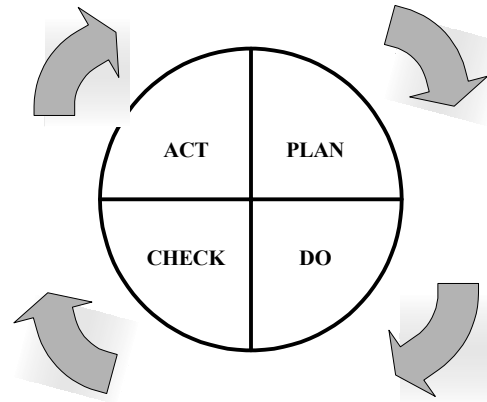


Figure 1 - PDCA Cycle

Business Management Systems

Businesses have multiple processes that must be managed. These include:

- financial management,
- personnel management,
- quality management,
- environmental health and safety management,
- inventory management and
- information management

While this list is not complete, it includes the major processes. The most common way of maintaining these processes is to develop independent systems and divisions responsible for each. Upper management then becomes responsible for "tying it all together."

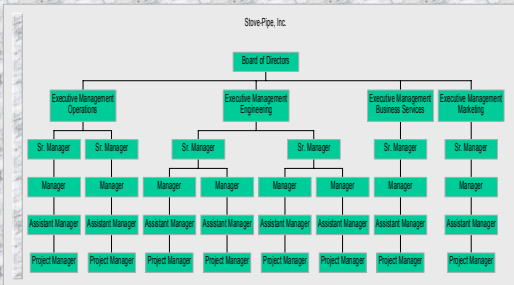
This method has its benefits but it also has certain limitations. All of the business management systems, working in concert, create an enormous amount of information for upper management to work with. Using the ISO model as stated above one can see numerous common elements. The key goal of all of the various systems is to measure and improve performance.

Key Management Concept: *If you cannot measure it, you cannot manage it.*

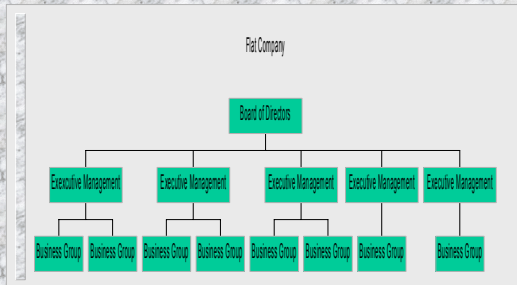
The Challenge

Most business are structured as discussed above to compartmentalize the organization. Each division is given a clear set of goals and areas of responsibility. The information they develop is communicated to the next level. All of the information is gathered from the various divisions and roll-up reports are forwarded to upper management. Armed with all the right data, Management is able to guide to the organization to profitability and/or sustainable growth. At least that is the theory.

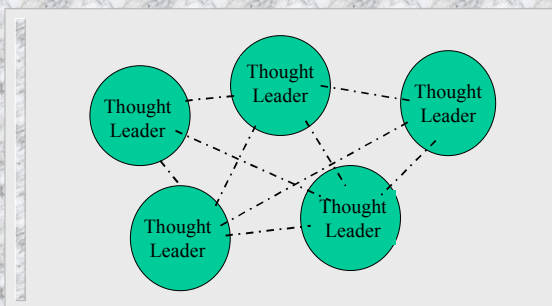
Stove-Piped



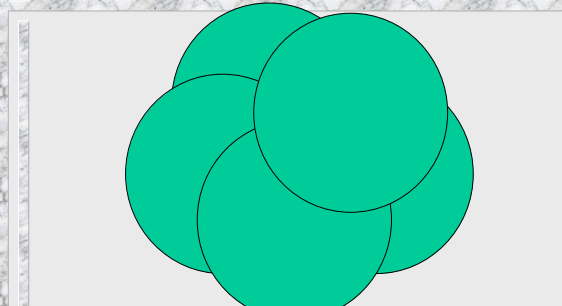
Flat Organization



Entrepreneurial



Integrated



Most organizations have been moving away from the traditional model, as described above, and more toward a flatter structure. This has worked well with human resources but has yet to take hold in the management systems structures. Following are some of the challenges which must be overcome:

Challenges

- **Overlapping Responsibilities**
- **Orphaned Responsibilities**
- **Conflicting Responsibilities**
- **Communication Barriers**
- **Disjointed Information Management**

Overlapping Responsibilities. The processes that a particular management system are responsible for are clearly defined. Tasks within those processes may not be. For example, who is responsible for HAZWOPER training and medical surveillance? The Human Resources (HR) division has personnel responsibilities but the Environmental Health and Safety (EHS) Manager has the responsibility of implementing the programs.

Orphaned Responsibilities. Some tasks and responsibilities fall between the lines on an organizational chart. Unlike the example above, no division takes ownership of the task. This situation is rare but plausible. Janitorial services may be an orphaned responsibility. Is EHS responsible because they dispose of solid waste? Is facilities maintenance responsible even though they don't fix anything? If they don't seem to fit anywhere does the responsibility default to HR?

Conflicting Responsibilities. In stove-piped systems organizations can at times be at odds with each other. An example of this could be found between the purchasing system and the environmental management system. In order to leverage corporate purchasing strength and simplify the purchasing process, the purchasing system has reduced the number of approved vendors. The environmental management system has identified "green" products from a vendor that is not on the approved list. The resulting conflict stresses both divisions and negatively impacts the entire organizations performance.

Communication Barriers. Information and metrics generated by one division may be useful to other divisions. Lack of or ineffective communication of this data to other divisions will create duplication of effort in generating the data, at best. At worst, it will result in an unnecessary failure when the relevant data was available. An example here would be when a production manager orders a new piece of equipment to enhance production. After the new equipment is installed it is discovered that the EHS manager evaluated the same piece of equipment a year earlier and found its impact would violate their Title V Air Permit. The modified air permit and resultant fees negated the saving of the new piece of equipment.

Disjointed Information Management. Different divisions have different goals and generate specific data and information for their own requirements. Often this information is gathered, maintained and processed by a Commercial Off The Shelf (COTS) software product geared toward a specific field of expertise. For example, EHS handles technical data, accounting handles financial data and HR handles personnel information. Data from one COTS package cannot be used or processed by another. This results in large amounts of information that must be manually correlated and interpreted.

What is Infrastructure?

Infrastructure is the framework that an organization is built on. It is composed of many elements working together to enable an organization or entity to function smoothly. In the case of a community, the infrastructure would be roads and transportation systems, utilities, communication services, human services and governmental services such as police and fire services. Infrastructure is all of the resources and systems required to efficiently operate. Business infrastructure includes the physical plant as well as the human resources required. It would also include:

- Marketing and sales
- Research and development
- Supply lines
- EHS
- Information management

It is the cost of doing business sometimes referred to as overhead. Every management system requires an adequate infrastructure to function effectively. Multiple management systems require an additional, overarching infrastructure to coordinate the entire organization. The more management systems you have the more resources are required to operate and maintain it. Each infrastructure increases the cost of operations and introduces an increase in the probability of failure.

Key Business Concept: *Increased number of systems means increased risk of failure and increased cost of maintenance.*

What is Infrastructure?

- **Framework**
- **Resources**
 - ◆ Physical Plant
 - ◆ Human Resources
- **Indirect (Overhead) Expenses**

Key Business Concept:

Increased number of systems means increased risk of failure and increased cost of maintenance.

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The Future Business Model

To reduce operating costs and increase probability of success, businesses are moving toward a new model. This new model focuses on a single infrastructure management systems that will expand the boundaries of the organization to include vendors, suppliers, partners, customers and other stakeholders. This new model is referred to as a Next Generation Enterprise or NGE. It is an interconnected organization that utilizes the internet and corporate intranets, enabling the sharing and exchange of information and data by all stakeholders.

Future Business Model

- Interconnected
- NGE
- ERP

Key Business Concept:
The Whole is greater than the sum of the parts, a.k.a. Synergy.

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Also driving the move to this new model is an information management package referred to as Enterprise Resource Planning (ERP). ERP will integrate all of the various systems in an enterprise, gaining synergy to enhance communication and exchange of data. The result will be a single infrastructure integrated management system requiring fewer resources and increasing performance.

Key Business Concept: *The whole is greater than the sum of the parts, a.k.a. Synergy.*

What Does This Have To Do With EMS?

Environmental Management Systems are built on the same model as business management systems. Managers recognize the serious threat that environmental problems pose to the success of their respective enterprises. The acceptance and implementation of EMS places environmental management in the mainstream of business planning and management. Environmental issues have become a part of most modern business policies and plans. As NGEs continue to develop, Environmental Management Systems need to be integrated with other management systems. This will make environmental aspects even more integral to the success of the enterprise.

What Does This Have To Do With EMS?

- EHS Integration into Business Processes
- Environmental Performance
- Stakeholder Interdependencies
 - ◆ Partners
 - ◆ Vendors
 - ◆ Clients
 - ◆ Employees

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Beyond Compliance

The term “beyond compliance” has become widely used by management system proponents. What does this mean? How does an organization get there and why would they want to? Compliance is a standard for measuring final output or “end of the pipe” performance. To get beyond compliance an organization must measure the performance of the entire process. One could comply with the requirement to fly a plane from New York to Los Angeles in five hours. However, if you have four near collisions with other planes and one with a mountain, land in the wrong direction, on the wrong runway and with the landing gear up you did not perform well.

“Beyond Compliance”

- What does this mean?
- How do you get there?
- Why would you want to?
- Improved Performance

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In this case, I would rather be beyond compliance. Though you reached your goal, you exposed yourself to greater risk and increased the probability of failure. Management systems are a tool to get an organization beyond compliance. Integrating multiple management systems brings all the tools together to maximize performance while reducing resource utilization

Benefits

Organizational - The NGE model of an integrated management system will benefit the organization in many ways.

- Reduced costs. A single infrastructure will require much fewer resources and a reduced level of effort to operate and maintain.
- Maximized Resource Utilization. Overlapping, orphaned and conflicting responsibilities will be reduced or eliminated as resources are managed from a central organization.
- Enhanced communication. The sharing of information and lessons learned will eliminate duplication of effort and avoid common failure.

CHMM - CHMMs can benefit from the integral part environmental issues have in the whole enterprise.

- Value Added. The CHMM is seen as asset rather than a liability to the enterprise.
- Business Manager. The CHMM is viewed as a business manager, not just a technician.
- Part of the Bigger Picture. The CHMM becomes an integral member of the enterprise.

The integrated management system poses a new challenge for the CHMM. They must develop business management skills to make the transition. If they are familiar with EMS concepts, they already have the basics skills to succeed.

NGE and Sustainable Development

If one were looking for an example of what an NGE may look like, look at models for sustainable development. Sustainable development takes into account a whole system and integrates all of the parts. Business managers have come to the realization that their continued existence hinges upon how well they manage all of their resources. Markets may continue to grow but the resources needed to address those markets are shrinking. With sustainable development models as a guide, CHMMs should be ready for their roles in an integrated management system.

Conclusion

Key Business Concept: *The only constant is change.*

Business management systems have evolved from the command and control, stove-piped organizations into robust, continually improving enterprises. The current state of the art creates multiple management systems addressing compartmentalized processes.

The challenges presented by this methodology are overlapping, orphaned and conflicting responsibilities, communication barriers and disjointed information management. Integrating all of an organizations management systems will create an enterprise that can reduce operational costs, maximize resource utilization and enhance communications. CHMMs involved with EMS can benefit from this integration, adding value to their organizations, becoming recognized as a manger and becoming a integral part of the larger enterprise. Using sustainable development as a model of an integrated management system, CHMMs are ready to play a vital role in enabling Next Generation Enterprises to get beyond compliance.

Benefits

- **Organizational**
 - ◆ Reduced Costs
 - ◆ Maximized Resource Utilization
 - ◆ Enhanced Communication
- **CHMM**
 - ◆ Value Added
 - ◆ Business Manager
 - ◆ Part of the Big Picture
- **Sustainable Development**

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Summary

Key Business Concept:
The only constant is change.

- **Command and Control to Performance Based.**
- **Leverage Synergy**
- **Maximize Resource Utilization**
- **EHS Integrated into Business Processes**
- **CHMM adds Value to the Organization**
- **NGE & Sustainable Development to get "Beyond Compliance"**

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