Integrated Management Systems

QMS, EMS, OHSMS, FSMS
Including Aerospace, Service, Semiconductor/Electronics, Automotive, and Food

Updated to the latest standard changes including ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2016

Includes guidance on integrating Corporate Responsibility and Sustainability

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Appendix 1

Integrating and Standardizing QMS, EMS, and OHSAS Management Systems– An Executive Management Primer

There is a proliferation of management system standards and requirements globally. These management system standards are either customer or industry mandated. Many standards are becoming a requirement for doing business (for example, ISO 9001, a Quality Management System standard with industry-specific versions such as ISO TS 16949 for Automotive, ISO 13485 for Medical Devices, and AS 9100 for the Aerospace industry; ISO 14001, an environmental management system standard; and OHSAS 18001, an occupational health and safety management system standard). There are yet other standards waiting in the wings that may soon become industry requirements for social responsibility or sustainability, laboratory management systems, and energy management systems. Typically, these standards are seen as hindrances or obstacles in the way of doing business and not beneficial.

Top management assigns these management standards to specialists in the company who then write manuals and procedures around quality, environmental, and health and safety management systems. The results are hundreds of procedures that impact the organization with multiple requirements for conducting a task (see Figure A1.1). How can a business manage these standards most economically? Are there efficient methods for managing them?

Figure A1.1 "I don't do quality, environmental, or health and safety, I just do my job."

The key to handling these standards efficiently is to understand the tremendous amount of commonality in requirements and expectations between them. For example, all of the management system standards require a policy, an objective, and a management review. Furthermore, each of them requires risk assessment and controls instituted for the risks identified. All of the standards require document and records control, internal audits, and corrective and preventive actions. This recognition of the common requirements has led to a methodology of integrated management systems (IMS) where requirements grouped together in the standard (called clauses) can be satisfied by a single business process. Businesses can economically and efficiently meet these standards with integrated and standardized processes that meet the requirements of QMS, EMS, OHSAS, and social responsibility. The goal of the primer is to make executive management knowledgeable of IMS and the steps that they can take in guiding their organization towards IMS. The appendix to this primer shows that most of the requirements of QMS, EMS, and OHSAS can be satisfied by approximately forty to fifty processes in an organization.

Integration of Management Systems

All management systems evolve from the continual improvement cycle called Plan Do Check Act (PDCA). This basic architecture has spawned common requirements in each of the steps of the PDCA cycle for the multiple standards. For example, in the planning step all management system standards include defining a policy, setting objectives, and creating a plan to meet the objectives and to evaluate the risks to the business. These common requirements of management systems can be met by common procedures or processes. This is a fundamental truth in the path to integrated management system standards.

Business Building Blocks are Processes

The fundamental organizational building blocks are the processes of an organization. This understanding is fundamental to integrated and standardized management systems. Businesses accomplish all tasks through processes that cut across functions of the business. See Figure A1.2. All management system standards have requirements that are fundamentally fulfilled when processes perform a task. Processes are typically first documented and then taught to the employees of an organization. Figure A1.3 illustrates a management system documentation pyramid.

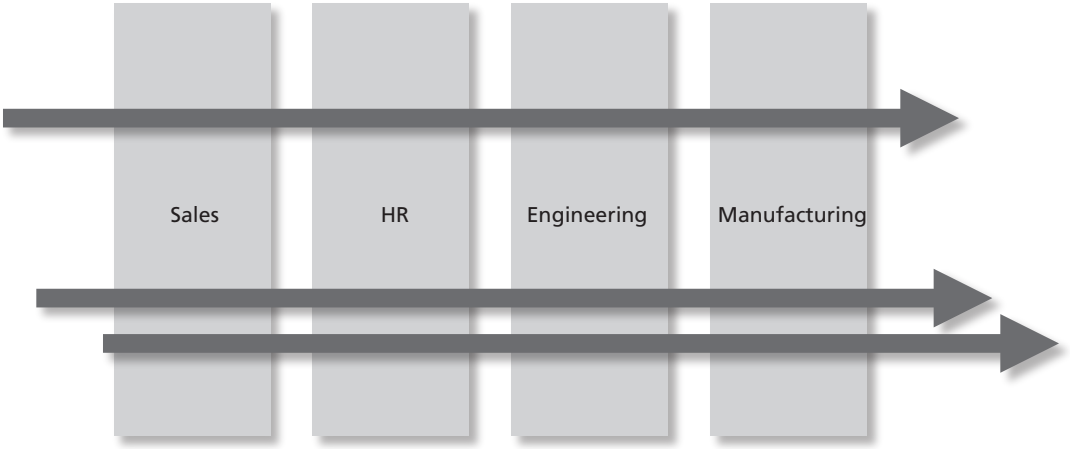

Figure A1.2 Processes cut across the functions of the organization.

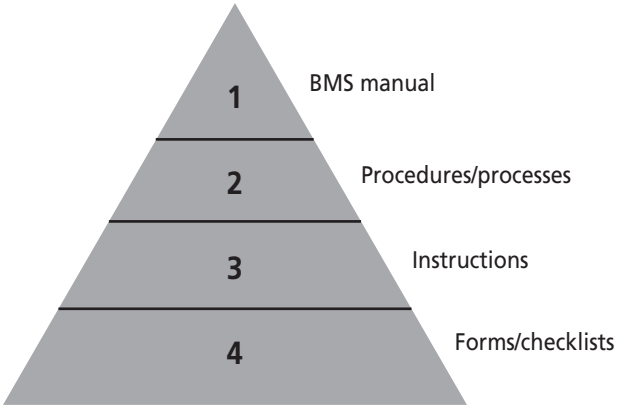

Figure A1.3 Management system documentation pyramid.

The manual provides direction and guidance on how an organization meets quality, environmental, and/or health and safety requirements. The procedures explain how functions work together to accomplish the fundamentals of the business including sales, design, and manufacturing. Work instructions are at the task level and tell someone exactly how to conduct an operation in a process or procedure. Forms and checklists are filled out when employees perform tasks in a process.

Integrated Management System Standards versus Stand-Alone Management Systems

Organizations that implement management systems with specialists do so with stand-alone systems rather than integrated management systems (see Figure A1.4). In most cases there is one documentation pyramid for each standard being implemented. In fact, if there are sixty procedures on average in each management systems of QMS, EMS, and OHSAS, then there are one hundred and eighty procedures impacting the organization with one hundred and eighty different process owners in stand-alone systems. In an integrated management system there are common procedures, what we call integrated procedures. In this example, sixty integrated procedures with sixty process owners is a definite improvement versus stand-alone systems. In a corporation with three sites, stand-alone systems will have 540 procedures and 540 process owners versus an IMS with standardized global processes, 60 procedures, with 60 global process owners. Less confusion and more efficiency is the hallmark of an IMS.

Tremendous cost savings can be achieved by implementing and maintaining an IMS. There is a cost savings in implementing an integrated management system in one site (that is, bringing together three systems into one system, called integration, and rolling out this one process to all the sites, called standardization). There are savings to both integration and standardization of the processes globally.

Integration and Standardization Costs

Integrated management system savings are 50% for implementation (of the second management system), 66% for maintenance, and 20% for third-party audits.

Integration and standardization result in 75% savings for implementation (for all sites after the first site), and 85% for maintenance. Reduction in third-party costs for multiple sites can be 20% of the third-party audit costs.

Savings from Integration for One Site

Assumptions: Cost of implementation of three management system standards, $200,000; maintenance costs, $90,000/year; and third-party auditing costs, $45,000 for three years.

Savings from implementation (one-time cost): $200,000 x .50 = $100,000

Savings from maintenance: $90,000 x .66 = $60,000 per year each site (NPV at 10% would be $600,000)

Savings from third-party audit costs: $3000 each year (NPV is $30,000)

Total Savings: $100,000 + $600,000 + $30,000 = $730,000

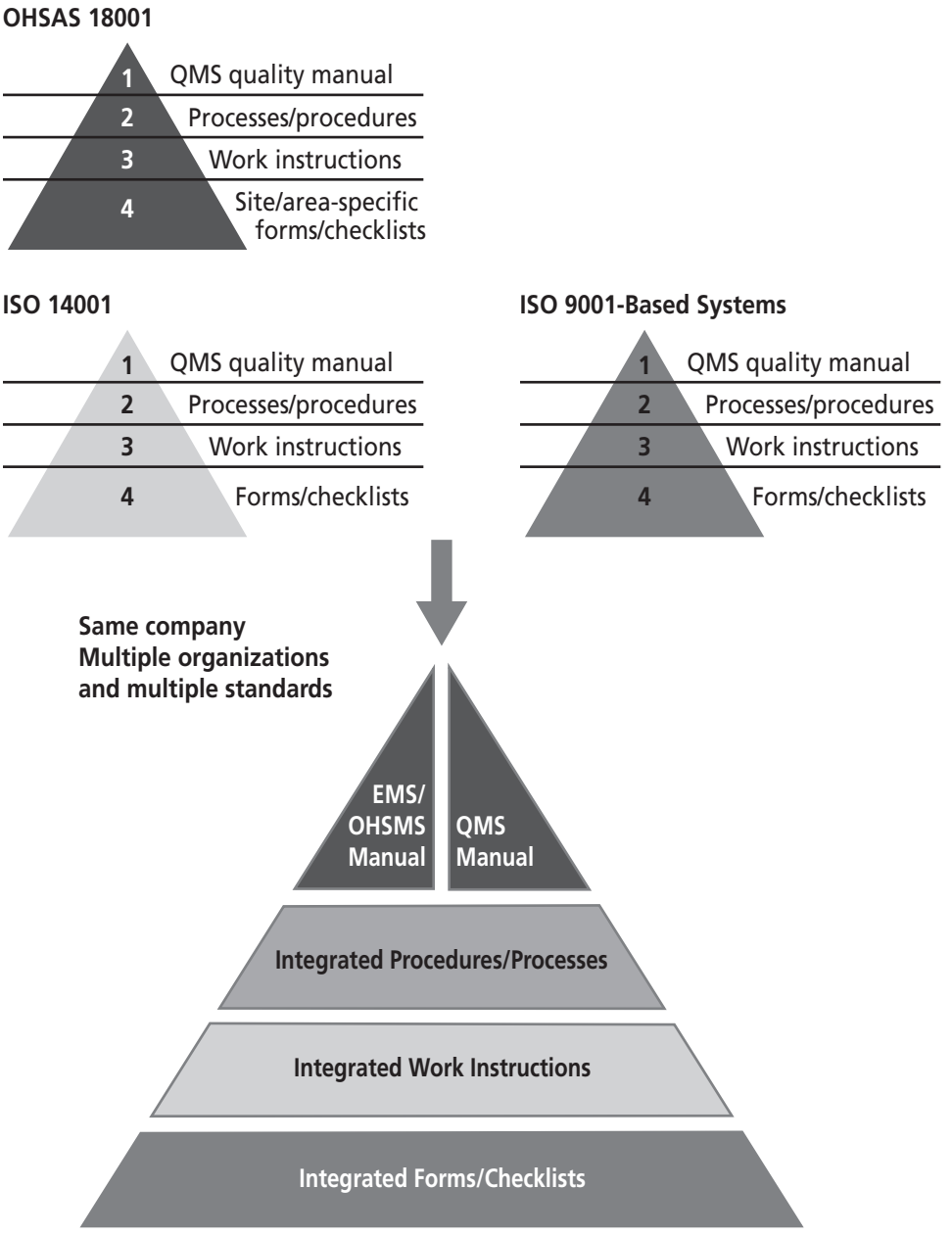

Figure A1.4 Stand-alone systems versus integrated management systems.

Calculating Savings for An Enterprise

Using the same numbers as Chapter 1, let us assume that the per-site costs for implementing three management systems are $200,000, the cost to maintain all three non-integrated systems is $90,000, and third-party auditing costs for a three year period are $45,000.

Savings in implementation costs for each site after the first one: $200,000 x .75 = $150,000 for each of the two remaining sites, or $300,000 for both of the sites.

Note: The savings for the first site is the savings from integration (that is, $200,000 x .50 = $100,000)

Total savings in implementation: $400,000

Savings in maintenance costs per year: $90,000 costs for each site x .85 = $76,500 for one site or $229,500 per year for all three sites (NPV at 10% interest is $2,295,000 for all three sites).

Savings in third-party audit costs for three years: $45,000 x .40 = $20,250 for one site for three years or $60,750 for all three sites for three years. Savings in one year for all three sites is $20,250 (NPV at 10% Interest is $202,500 for three sites).

There is an additional savings from doing integrated risk analysis or using one methodology and reusing risk scores between sites. If we assume $50,000 is spent each year in each site for calculating risk for new products and processes, then the cost is $150,000 for the three sites and the NPV for integrated risk at 10% is $1.5 million.

The grand total for all three sites for integration and standardization is $400,000 from implementation plus $2,295,000 for maintenance plus $202,500 for third-party auditing, or $2,897,500 for three sites. When we include integrated risk analysis, savings increase to $4.4 million.

Is Our Organization's Management System Integrated?

From the previous section, we learn that there is a tremendous opportunity for savings from implementing an IMS in an enterprise. This is the reason that top management should be interested in implementing it in their organization. These hard savings are only the tip of the iceberg, with additional savings arising from the efficiency of the integrated processes. One of the first steps is to understand how integrated the organization's current management systems are. Here are some simple questions that top management can ask.

Key Questions

a. Have any of our sites integrated QMS, EMS, OHSAS, and other management systems?

If the answer is no, then proceed to the next set of questions below.

- Does the organization have one manual?
- What percent of the processes and/or procedures of the management systems are common?
- What percent of the work instructions of the organization are integrated?
- What percent of the forms and checklists of the organization are integrated?
- Are there process measures for the integrated processes?
- Are there process owners for the integrated processes?

Proceed in this fashion to understand how many sites have integrated management systems.

b. Next, find out whether the sites with integrated processes have integrated the risk analysis for the QMS, EMS, or OHSAS.

c. Find out whether the integrated sites have integrated the audits.

This is the first step of IMS in an organization (that is, discovering the level of integration in the sites). Integration by itself saves money. Next we study standardization between the processes in the sites with integrated management systems.

d. Find out whether the sites that have integrated have also standardized their processes.

- Does the organization have one manual for the entire corporation or the sites that have integrated?
- What percent of the processes and/or procedures of the organization are common (or the sites that have integrated)?
- What percent of the work instructions of the organization are common (or the sites that have integrated)?
- What percent of the forms and checklists of the organization are common (or the sites that have integrated)?
- Are there global process measures for the global processes?
- Are there global process owners for the global processes?

In the book on integrated management systems we have numerically assessed the above.

When top management have asked the questions in this section, they should know which sites are integrated and to what percent. They should also know which of the sites have standardized and to what percent. See Table A1.1 for a site–process integration example.

Table A1.1 Site–process integration example.

Site	Integrated	Manual	Procedures	Work Inst	Forms and Checklists
1	QMS – No				
1	EMS/OHSAS – Yes	100%	70%	0%	30%
2	QMS, EMS, OHSAS – No				
3	QMS, EMS, OHSAS – No				
4	QMS, EMS, OHSAS – No				

One site has integrated the EMS and OHSAS manuals and procedures.

Site	Standardized	Manual	Procedures	Work Inst	Forms and Checklists
1, 2, 3, 4	No				

There are no common manuals, procedures, work instructions or forms/checklists company wide. The answer is no, they have not standardized.

Making Sense of the Assessment

Conducting the assessment will be an eye opener for top management. It is the rare organization that has sites with integrated systems. However, if there are integrated sites, try to estimate to what percent the processes and the risk are integrated in each of the sites. In our example, there is much savings to be had in integration and standardization in the four sites. Of the four sites, only one has integrated EMS and OHSAS; overall, there is at most a 13% integration. There is 0% standardization between the four sites.

The savings numbers can be calculated using the numbers from our previous example ($5.2 million for the four sites). This is a combination of implementation, maintenance, auditing, and integrated risk savings.

There are many intangible savings—company-wide ownership of quality, environmental, and health and safety and knowing that the whole company is working with the same common processes.

How Do We Get Started?

Organizations typically start when top management is convinced about the need for integrated and standardized management systems. If this primer is not enough, start with an executive overview. If need be, the executive overview can be conducted after an initial assessment of the organization to figure out the percentage of current integration and standardization and the potential savings.

After the initial assessment an implementation plan can be drawn up to integrate and standardize the organization. As mentioned in earlier chapters, it is best to standardize about ten to fifteen processes in a nine-month time frame and then continue the standardization process and do the next ten or fifteen processes later. Yes, all processes can be standardized in one go, but it is not possible to implement Best in Class processes while standardizing forty to sixty processes at the same time.

Companies can go forward with the confidence that standardization and integration works; the authors have been implementing them since 2002. The book includes five case studies of companies in the United States, Asia, and the Middle East in industries ranging from automotive, aerospace, and semiconductor to food and service.

About the Authors

CHAD KYMAL

Chad Kymal is the CTO of Omnex Inc., an international Consulting and Training organization headquartered in the United States. After graduating from the General Motors Institute, Chad spent a number of years working at General Motors and KPMG before founding Omnex Inc. in 1986. Over Chad's successful career, he has served on the Malcolm Baldrige Board of Examiners and has received numerous quality achievement awards, including the Quality Professional of the Year award by the American Society of Quality Automotive Division in 2005. In addition to his Bachelor's degree from GMI, Chad holds both a master's degree in industrial and operations engineering from the University of Michigan and an MBA from the University of Michigan.

Chad both developed and teaches auditor training for ISO 9001, ISO 14001, and OHSAS 18001, as well as an Integrated Management Systems Lead Auditor training course where all three standards are combined in a single audit. Chad is the founder of AQSR a global registrar that routinely provided integrated audits in QMS, EMS, and OHSAS.

Chad is the author of four books and more than 100 papers including several on integrated management systems.

R. DAN REID

R. Dan Reid, the Omnex Director of Consulting, is best known as an author of *QS-9000, ISO Technical Specification (TS) 16949, ISO 9001:2000*, the first ISO International Workshop Agreement (IWA 1), which applies ISO 9001 to healthcare and its replacement, AIAG's Business Operating Systems for Healthcare Organizations (HF-2). He also worked on the Chrysler, Ford, and GM *Potential Failure Mode and Effects Analysis, Production Part Approval Process,* and *Advanced Product Quality Planning* manuals.

While at AIAG, Dan led successful projects for Effective Problem Solving, Cost of Poor Quality, and Supplier Management. While at General Motors, among other assignments, he led the Supplier Development Administration, served on the Chrysler, Ford, GM Supplier Quality Requirements Task Force, which was responsible for QS-9000 and later ISO TS/16949, and he established a Supplier Quality function at GM Service Parts. He later established a Supplier Quality function at Baxter BioScience Division's Los Angeles plant before serving as the BioScience Divisional Supplier Quality Director.

Dan, an ASQ Fellow and ASQ Certified Quality Engineer (CQE), has received numerous awards and is recognized for a number of accomplishments:

- The first Delegation Leader of the International Automotive Task Force (IATF)
- A member of the Parenteral Drug Association
- A member of the American College of Health Care Executives
- A published author with McGraw Hill, ASQ Press, and others
- A member of the ASQ Administrative Committee and Technical Reviewer
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GREG GRUSKA

Greg Gruska, a Fellow of the American Society for Quality (ASQ), is the principal consultant in performance excellence for Omnex. Greg is a member of the team that developed the new AIAG Effective Problem Solving guideline for practitioners and leaders (CQI-20 and CQI-21). He has taught and assisted hundreds of practitioners in problem solving methodologies and tools.

Greg is also an active/writing member of the MSA, SPC, FMEA, EFMEA, and EPS Manual subcommittees of the American Automotive Industry Group (AIAG) Supplier Quality Requirements Task Force, which is part of the international task force governing TS 16949. Greg is an adjunct professor at Madonna University. He has advanced degrees in mathematics and engineering from the University of Detroit, Michigan State University, and Wayne State University. He was the Deming Memorial Lecturer at the Sheffield Hallam University for the year 2000.

Greg is a charter member of the Greater Detroit Deming Study Group and the W. E. Deming Institute. He is an ASQ certified Quality Engineer, a licensed Professional Engineer (CA - Quality), and a member of the Board of Examiners of and Judge for the Michigan Quality Leadership Award (1994-2011). Greg is on the writing committee of AIAG on FMEA, a member of the SAE Functional Safety Committee (J2980), and considered one of the foremost authorities on risk management in the world. He has considerable hardware and software experience in automotive applications