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This report is a product of the California Space Authority, developed with the support of the NOVA Workforce Board

CALIFORNIA SPACE AUTHORITY

NOVA workforce board

in partnership with

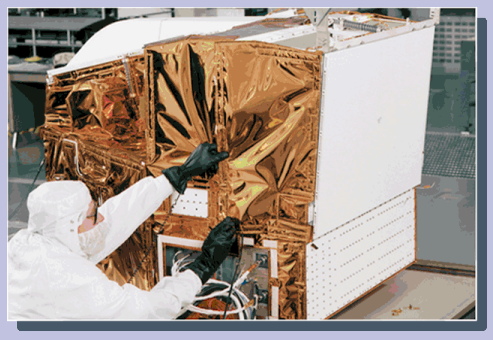
California Innovation Corridor

LABOR & WORKFORCE DEVELOPMENT AGENCY

Wired TALENT DRIVING PROSPERITY

Supply Chain Transformation

The Role of Workforce Investment Boards



Supply Chain Transformation

The Role of Workforce Investment Boards

November 2008

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Supply Chain Transformation:
The Role of Workforce Investment Boards

Executive Summary

The NOVA Workforce Board was asked to join the "smart supplier" initiative led by the California Space Authority under its Workforce Innovation in Regional Economic Development (WIRED) grant from the U. S. Department of Labor. The overall purpose of this initiative was to characterize foundational "smart supplier" competitiveness skills for organizations. NOVA's role was to learn about the challenges and opportunities occurring with the transformation of supply chain management and to share that information with the California workforce investment community. The result is this white paper to introduce workforce investment boards to supply chain management concepts and to familiarize WIBs with the challenges facing suppliers, with a particular focus on the aerospace and defense industry.

For two decades, NOVA has earned recognition for its labor market research studies. These studies focus on industries such as healthcare, education, software, and biotechnology, among many others, and typically delve into an industry through the perspectives of workers, employers, and educators. Through our experience, we have learned that in order to be perceived as relevant and valued, we need to develop a true understanding of an industry, including its culture and language, threats and opportunities, requirements for operations, inefficiencies, and what creates a competitive advantage. Often this deeper understanding leads us to consider the intersection of an industry with us as a WIB; i.e., is there action we can pursue to help address industry workforce issues that coincides with our own vision and mission.

This paper introduces supply chain concepts at a high level and highlights "smart supplier" requirements, focusing on those of relevance to WIBs. Of key importance is the finding that suppliers rate a "highly trained workforce" as critical to their success, and the paper suggests various ways that WIBs might engage with supplier companies. An understanding of the aerospace industry's concepts and challenges provides the foundation for WIBs to be seen as integral players for workforce development and economic success.

Supply chain management is evolving due to globalization and other factors. Some features of this transformation include:

- Integration of competencies and assets—less often does a company "own" the beginning, middle, and end of its supply chain.
- Suppliers are taking on more responsibility and risk related to the end product.
- Suppliers have more responsibility for fostering innovation.
- Suppliers are more aware of the entire production cycle and how they fit in.

As NOVA was learning about supply chain transformation, it became apparent that many of the recommendations for process improvement that aerospace contractors and suppliers are dealing with are good business practices in general. In fact, they have relevance for workforce investment areas as we work through service integration, as evidenced by these recommendations from a Northrop Grumman executive:

- Accept the reality of a global marketplace and understand cultural differences.
- Understand the need for speed (time is money).
- Meet the transformation incrementally.
- Your middle name must begin with "e-" (go paperless).
- Embrace 6 Sigma and Lean (stay on par with current business practices).
- "If it ain't broke, break it!"

The paper concludes with examples of best practices, both aerospace specific and in general, among workforce investment areas in terms of partnerships and community relevance.

The Appendix to this white paper consists of a resource guide targeted to the needs of suppliers, also developed under the "smart supplier" initiative. It includes resources for workforce development, education and training, quality assurance, and other tools to enhance supply chain management effectiveness.

Background

What is supply chain management?

The **supply chain** is defined as "the sequence of steps, often done in different firms and/or locations, needed to produce a final good from primary factors, starting with processing of raw materials, continuing with production of perhaps a series of intermediate inputs, and ending with final assembly and distribution."[1] The three primary elements of any supply chain are suppliers, producers, and customers. It may also encompass service and support functions. **Supply chain management** encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.[2]

How is supply chain management changing?

Globalization

Technology and events have accelerated the globalization trend. This new, "flatter world"[3] means collaboration and competition from more places. Today North American and European aerospace suppliers are competing with the reduced cost structures of rivals in Asia, Eastern Europe, and Latin America. Suppliers are also under increasing pressure to move their sub-tier businesses to lower-cost regions. Just as in the automotive industry in the 1990s, aerospace suppliers must learn to globalize their activities and attitudes.[4]

Supply Chain Integration

The automotive industry was a leader in transferring direct task responsibilities to its suppliers. Today aerospace is adopting those techniques, inviting suppliers to take on more responsibility and share risks.[4]

The U. S. integrated vertical stable supply chain model is evolving into a global, dynamic, complex supplier network with prime contractors looking to the supply base for up to 80 percent of the required process and product innovation.[5] As value creation and design and engineering tasks are shifted to the supplier level, the aerospace industry needs suppliers that design, test, and produce

with the highest levels of reliability. To be competitive today, suppliers must be aware of the entire product development cycle, how their products and processes fit into it, and how they can potentially improve overall end product cost and quality.

In a 2006 presentation on supply chain process transformation, Charles Heckrotte, Director of Material for Northrop Grumman, had the following recommendations for suppliers:[6]

- Accept the reality of a global marketplace: Be aware of the cultural differences when going global.
- Understand the "need for speed": When Northrop's designs are slow to release, can you make up the difference?
- Meet the transformation incrementally: Resist the tendency to be all to all…today. Take the time to be right.
- Your middle name must begin with "e-": We are a less paper world going paperless. It is the requirement for velocity.
- Embrace 6 Sigma and Lean: Both buyers and suppliers are knee deep in these enablers. Stay on pace with your customers.
- "If it ain't broke…break it" (Robert Kriegel): Keep changing. Get ahead of the curve. Stay ahead of the competition.

In the "flat world" environment, supply chain winners will be those who:

- Produce on demand
- Streamline logistics to keep production and delivery on schedule
- Manage costs
- Create strategic supply chain alliances.

This greater complexity creates huge opportunities for suppliers but will require increased knowledge and capabilities, as well as increased collaboration. It will be critical for suppliers to develop or obtain workforce talent that can contribute to complex manufacturing processes and compete against low-cost alternatives.[7]

Why is supply chain transformation important to understand?

With more than 3.5 million manufacturing jobs lost in the U.S. over the past decade and a half, the current need to increase global competitiveness is significant. The California manufacturing sector constituted 13 percent of the national decline during that period. The impact of the manufacturing

supplier network on the California economy is huge in terms of both jobs and revenue. For example, a single large manufacturer has 6,000 California companies as suppliers to which it provides revenues of $5.6B annually, affecting 60,000 jobs. With regard to the aerospace industry, 50 percent of all U.S. aerospace suppliers are based in California. Eighty percent of California aerospace manufacturing employees work for companies with fewer than 100 employees.[5]

The changes happening across the supply chain are driving suppliers' workforce and training needs. *The workforce investment system can play a key role in meeting these needs.*

The "Smart Supplier" Survey

CSA and the WIRED Grant

As part of its Workforce Innovation in Regional Economic Development (WIRED) grant, the California Space Authority (CSA) led an initiative to characterize "smart supplier" competitiveness skills. CSA commissioned the 21st Century Supply Chain Transformation Survey, which was developed by Antelope Valley College with input from CSA and its members, prime contractors, multi-tier contractors, government entities, professional associations, workforce investment boards, and other educational partners. The survey follows the product development life cycle from requirements through support. There were 288 respondents representing the aerospace manufacturing supply chain; approximately half were senior management, and another one-third were individuals directly involved in supply chain implementation.

Survey Findings

Some key findings of the survey and related supplier forums include:[7]

- Supplier companies need to collaborate earlier and more often at all supply chain integration points – product design, analysis, quality, manufacturing, distribution, and logistics. While many companies felt they have the required capabilities, they are collaborating up and down the supply chain less than 25 percent of the time.
- Systems knowledge is required, including interdisciplinary problem solving.
- The shortage of skilled production workers is the main concern for small- and medium-sized companies.
- The shortage of science and engineering professionals is the main concern for large companies.

Top Three Success Factors

Survey respondents were asked to select the top three issues that are the most important to their company's success in the next three years. Across all companies, a "highly trained workforce" and "lowering production costs" were rated as most important, both with approximately 60 percent of respondents. Small companies, in particular, ranked workforce as their number one issue, while mid-sized companies rated "lowering production costs" slightly higher and large companies rated workforce, costs, and supply chain integration of equal importance.

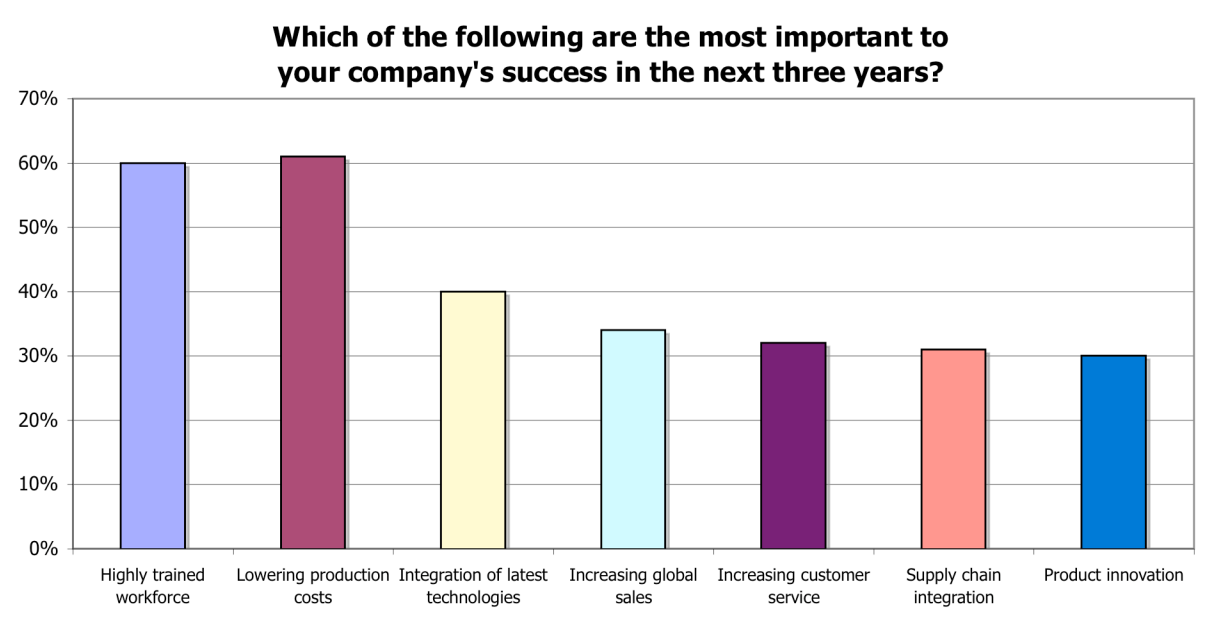

Figure 1 Three-Year Importance

Workforce Shortages

The survey also addressed labor supply and training needs. When asked, "Where do you anticipate a shortage of employees to occur within your company in the next five years?" respondents overwhelming selected skilled production workers and scientists and engineers (Figure 2). Small companies placed greater emphasis on skilled production workers, while large companies placed the emphasis on scientists and engineers. Management was third on the list across all company sizes, followed by customer service.

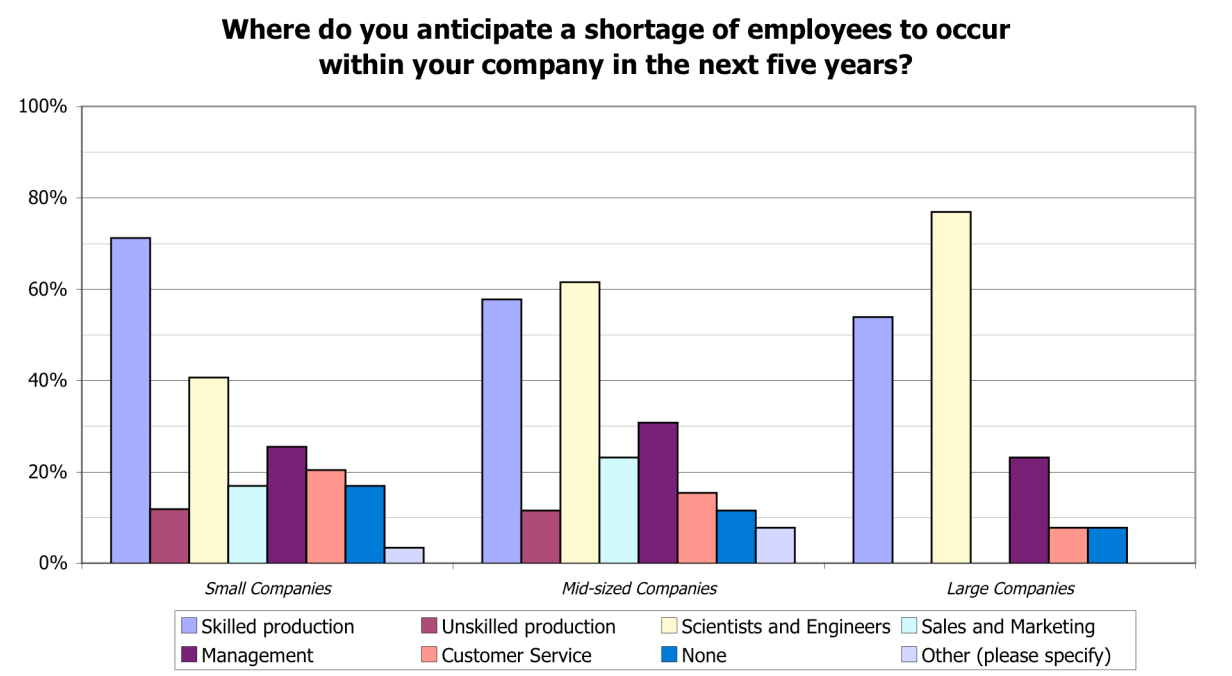

Figure 2: Perceived Five-Year Employee Shortages

Training

The need to keep current workers skilled in the latest technologies and to increase the skill level of entry-level employees were two of the top three reasons that companies at all three size groups gave for providing training.

With respect to the source of training, over 80 percent of mid-size companies, over 90 percent of large companies, and almost 100 percent of small companies indicated that they use internally developed training (Figure 3). Additionally, over 95 percent of respondents who indicated basic skills and technology skills as the predominate reasons their company provides training also indicated that they develop training internally. This suggests that there may be duplication of effort in training development that could be diminished through utilization of common training resources.

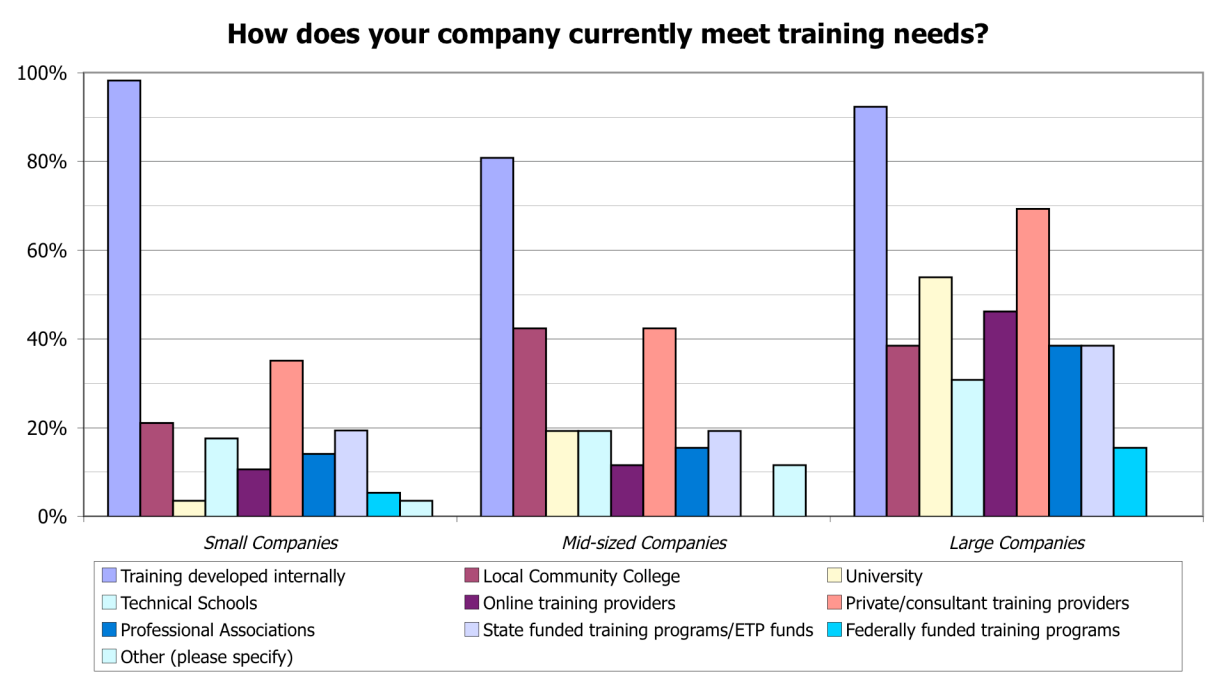

Figure 3: Current Training Delivery

A follow-up survey gathered data about the methods used to deliver training to employees. All companies predominately used "On-the-Job Training" with "Classroom Training" being utilized slightly more so among mid- and large-sized companies. Nearly 20 percent of mid-sized companies and 40 to 50 percent of large companies are utilizing computer-based training and web-based training; however, computer-based training is being used by only 10 percent of small companies and web-based training by just over 3 percent.

Universities were used as a source of training at higher levels for over 50 percent of larger companies. Community colleges were used to meet the training needs of about 20 percent of the small companies, and about 40 percent of the mid- and large-sized companies. About 80 percent of mid-sized and nearly 60 percent of small companies are satisfied with graduates of community college certificate programs; this drops to 30 percent for large companies. There is a continuous need for California community colleges to update their programs to align with the rapidly changing needs of state and local industry (Figure 4).

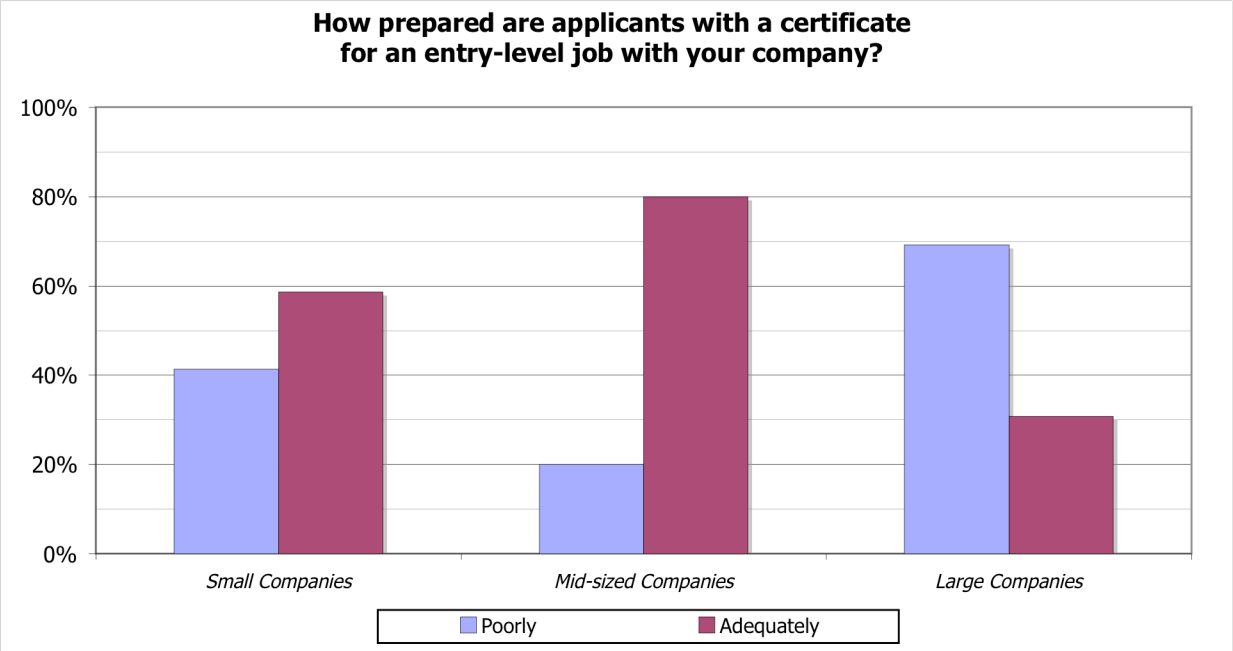

Figure 4: Preparation Levels

Training Priorities

Training priorities include supply chain management and functional best practices, basic skills, and ongoing technology training. The wide variety of additional training areas suggested by respondents may indicate a need for a common applied technology assessment process with associated specific skills training. A supply chain management overview seminar is being developed under the WIRED program that addresses: supply chain principles in a global environment; supply chain relationships and structure, including working in a global, dynamic, complex system; regulation; cross-functional systems engineering basics; and project management basics. The WIRED supply chain seminar will be offered by Antelope Valley College in conjunction with industry co-hosts.

Workforce Development Practices

More than 60 percent of the large corporations that responded to the survey indicated that they had workforce development plans with defined skill requirements, assessment, gap analysis, and training for all positions (Figure 5). An additional 30 percent have them for key positions. Roughly 50 percent of mid-sized companies said they have programs in place for key positions, almost 40 percent have plans for all positions, and 10 percent of mid-sized companies have no plans. Fully 40 percent of small companies have no plans, while roughly 30 percent have plans for all positions or

key positions. This may suggest a potential need for Human Capital Development training for small companies.

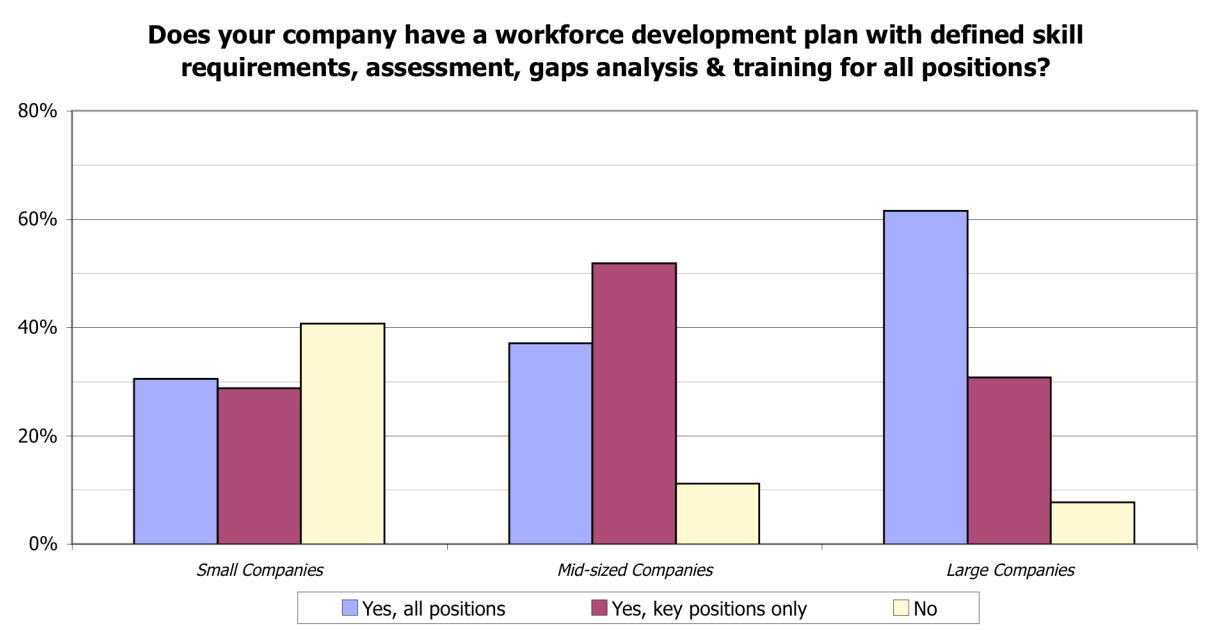

Figure 5: Workforce Development Plan

Training Recommendations

CSA's report on the supplier survey concludes that a common approach and common resources to address training needs would be beneficial, perhaps with a common assessment process for applied technology skills. With the majority of respondents stating that they develop training internally, there is a role for the community college system and other education entities as well as industry to support aerospace supplier transformation training priorities.

The Role of Workforce Investment Boards

How can the workforce investment system add value to businesses in supply chain management?

Workforce investment boards (WIBs) in regions with aerospace businesses and suppliers need to understand the culture and language of the industry in order to effectively function as a partner to the industry. They need to be familiar with industry threats and opportunities and what it takes to create a competitive advantage. They should understand the challenges facing prime contractors and suppliers as supply chain transformation occurs.

As the CSA survey revealed, the aerospace industry has several unmet needs relative to workforce. Armed with an understanding of these needs and of industry culture, WIBs are in a unique position to assist the industry. WIBs often have the connections with economic development, education providers, chambers of commerce, and other organizations that can be leveraged to augment the vitality of the aerospace industry.

Before pursuing possible actions, WIBs need to assess whether they are choosing the "right" objectives using such criteria for potential projects as:

- Is it good for job seekers/workers – will it encourage self-sufficiency?
- Is it good for business viability?
- Is it good for the local economy? Is there a public benefit?

And most importantly:

- Does it coincide with the WIB's vision and mission?

There are several roles that WIBs can play, which are explored in further detail below.

Recruiting the Aerospace Workforce

The Aerospace Industries Association forecasts that U.S. aerospace industry sales will grow 6 percent, or $12 billion, to a record $210.6 billion in 2008. The increase will be driven primarily by increased delivery of civil aircraft, engines, and related parts and components.[8] However, the aerospace industry is facing a potential skilled workforce shortage, particularly in science and engineering.

The Aerospace Corporation, which provides independent research, development, and advisory services to national-security space programs, states that in 2008, approximately 27 percent of employed engineers will be eligible for retirement, and during the next decade, the number of employees with science and engineering degrees reaching retirement age will triple.[9] Myles Crandall, VP of strategic development at Lockheed Martin, stated in a January 2008 interview with NOVA staff that the aerospace and defense industry will face a shortage in the coming years of 80,000 workers, and that Lockheed Martin alone is hiring 14,000 new employees nationwide every year.

While the aerospace and defense industry is making a concerted effort to attract new employees, there is a large gap in the 30–40-year-old range, where it is estimated that supply is actually up to 46 percent below demand. The Aerospace Corporation says that systems engineering and software engineering are two disciplines that space prime contractors have designated as critical skills areas. Manufacturing-related critical competencies have also been identified, including the need for skilled fabrication mechanics, tooling engineers, welders, test operators, and electromechanical technicians. The need for scientists and engineers as well as production workers echoes the findings of the CSA survey.

The Aerospace Corporation feels that more needs to be done to meet workforce demand, in particular at the 30–40-year-old range, stating, "Attracting … these individuals from alternate industries is the challenge for the United States to meet in the next 5 to 10 years." Workforce investment boards could market both the professional and skilled production opportunities to adults who may have been laid off from other fields and assist them to transition into aerospace and defense.

Assisting in the Development of Training Programs

The CSA supplier survey indicated a high need for employee training, particularly among small companies. Most smaller companies are providing training in-house, resulting in potential duplicative efforts, and are under-utilizing community colleges as training providers. The survey also suggested a need for a common technical skills assessment and certification process.

Workforce investment boards are well positioned to work with local training providers to develop and/or replicate supply chain training programs. The WIRED grant administered by CSA funded several programs designed to support the development of the aerospace and defense workforce (see the website at http://www.innovatecalifornia.net/).

WIBs can serve as a resource to local aerospace companies to connect them with training programs that can meet their needs or to assist them in working with training providers to customize training. As an example, NOVA partnered with UC Extension-Santa Cruz to design an aerospace training program for transitioning dislocated workers, with input from Lockheed Martin and Rockwell Collins as to industry needs.[10] WIB business services teams can also link companies with other training resources with which they may not be familiar, such as ETP, and with links to "soft skills" training and retention resources.

With WIBs' familiarity with assessment instruments, they may be able to assist with the development and implementation of a common skills assessment process. Smaller companies may benefit from assistance with developing individual career development plans for their employees.

Serving as a Connector

Where WIBs can really shine is as a "connector"—an intermediary to "connect the dots" between employers, educators, labor, economic development organizations, and job seekers. WIBs can be the catalyst that brings these organizations together to meet a common need, that of supporting their local industry, whether it is aerospace or another driving industry.

A WIB functioning as an intermediary provides organizations, institutions, businesses, and people access to the information that they need to make informed decisions, and provides a mechanism to connect them to each other.[11]

WIBs have served an important role in bringing together the business community in a particular industry sector and educational agencies to help "translate" from one system to the other, and to help develop services that meet the needs of business. In other places, WIBs have brokered training programs and services between employers and training providers.

For more information on how WIBs can carry out their various roles, including WIB case studies, please refer to the WIB toolkit that has been developed through the CSA WIRED grant.[11]

Best Practices from Other Regions

Several regions of the country have developed projects to address regional workforce needs through collaboration of several stakeholders. A few are highlighted below; see the "References" section for further information.

New York's Tech Valley region has created a multi-faceted regional strategy for meeting the current and future workforce needs of its aerospace and transportation equipment sectors. The strategic plan was created by a task force with partners including the local workforce investment system, the chamber of commerce, and several colleges and universities.[12]

The North Central **Texas** Workforce Board partnered with manufacturing industry associations and community colleges to develop supply chain logistics skills training and certification. The project was funded by a President's High Growth Job Training Initiative grant.[13]

Four **Connecticut** and one **Massachusetts** workforce investment boards joined with aerospace component manufacturers and community colleges to create a project to meet the common workforce development needs of aerospace, fabricated metals, and medical device supply chains in two states. The project was developed in response to the realization that in order for small and mid-size companies to be competitive, their production and technician workers needed training in supply chain management.[14]

The Workforce Development Board of South Central **Wisconsin** has taken a unique leadership role in promoting and implementing a regional strategy for economic and workforce development. Combining the forces of two WIBs, resources were used to compile the background data needed to better understand the dynamics of the region. The partnership then developed recommendations to improve worker skills, firm productivity, economic development, and long-term planning.[15]

The **National Business Learning Partnership**, a Department of Labor initiative, developed case studies of several workforce areas a few years ago to demonstrate practices and principles proven to improve performance outcomes by addressing the workforce needs of businesses and industries. The NOVA case study highlights how NOVA has adapted to Silicon Valley regional characteristics and broadly integrated itself into the life of the region. The Boston study reflects its continuous innovation through intensive business partnerships. The Houston case study shows how the Gulf Coast redefined its board to focus its energies toward leadership of the workforce development system, rather than simply the management of workforce programs. The North Central Pennsylvania study demonstrates how this workforce board has fully incorporated services to employers into its overall structure and processes.[16,17,18,19]

More recently, a WIB toolkit was developed as part of the CSA WIRED project. It includes case studies of five California WIBs, demonstrating how WIBs can carry out various roles as community leaders.[20]

Conclusion

In today's changing environment, supplier companies must transform their processes in order to remain competitive. There is a shift in value creation to suppliers, and the aerospace and defense industry needs suppliers that can adjust to greater complexity and that can produce with the highest levels of reliability. Suppliers need to develop workforce talent that can contribute to complex manufacturing processes and compete against low-cost alternatives.

The recent Supplier Transformation Survey revealed that suppliers rate a highly trained workforce as key to their success, yet most are facing shortages of skilled production workers as well as scientists and engineers. While training is important to the surveyed suppliers, smaller companies tend to develop training internally, resulting in potential duplication of effort.

Workforce investment boards can contribute to supplier success by assisting with workforce recruitment, providing links to training resources, and by utilizing their many partnerships to make connections between industry, economic development, education, and job seekers. WIBs can enhance their contributions to the economic success of their communities by developing an understanding of the requirements and challenges of the driving industries in their regions.

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Supply Chain Resource Guide

This guide is a product of the California Space Authority, developed with the support of the NOVA Workforce Board

Welcome to the supply chain resource guide. This guide is intended to provide contractors and suppliers in multiple industries with tools to enhance their supply chain management effectiveness.

One caveat—there are many available software, e-business and consulting solutions for logistic needs as well as a number of private training organizations that could be used to gain specific desired outcomes. While we focus on public training programs, we do include a sampling of for-profit programs. This guide is not intended to be all-inclusive nor is inclusion considered an endorsement, and we make no guarantees as to the accuracy of the sites referenced.

General Supply Chain Management Resources

www.supplychainbrain.com
An all encompassing site covering SCM news, training options, suppliers, white papers, events calendar, requests for proposals, career info. As its tagline states, The Nerve Center for Today's Supply Chain News, Developments and Innovative Thinking.

www.nxtbook.com/nxtbooks/keller/supplychainmgmt/index.php#/53/OnePage
Supply chain management resource guide and supplier directory.

www.supplychain-logistics.com
SupplyChainStar (the title of the site) is another encompassing site – this one more directed to software solutions, but a smattering of other topics also.

http://cscmp.org/default.asp
The Council of Supply Chain Management Professionals (CSCMP) is an association for individuals involved in supply chain management, providing educational, career development, and networking opportunities to its over 9,000 members and to the entire profession.

www.ism.ws
The Institute for Supply Management (ISM) is a not-for-profit supply management association that provides opportunities for the promotion of the profession and the expansion of professional skills and knowledge. ISM works to lead the supply management profession through its standards of excellence, research, promotional activities, and education.

www.supply-chain.org
The Supply Chain Council (SCC) is a global non-profit consortium whose methodology, diagnostic and benchmarking tools are used in supply chain processes. SCC has established an accepted framework for evaluating and comparing supply chain activities and their performance. The framework— SCOR® process reference model—lets companies quickly determine and compare the performance of supply chain and related operations within their company or against other companies.

www.sme.org
The Society of Manufacturing Engineers is a manufacturing technology information resource for people and companies throughout the manufacturing supply chain and works to promote an increased awareness of manufacturing engineering - keeping manufacturing professionals current on trends and technologies.

www.amrresearch.com
AMR Research is a research firm focused on the intersection of business processes with value chain and enterprise technologies.

http://lean.mit.edu/
The Lean Advancement Initiative (LAI) at MIT offers organizational members from industry, government, and academia the newest and best thinking, products, and tools related to lean enterprise transformation. LAI is a unique and powerful research consortium that provides a neutral forum for sharing research findings, lessons learned, and best practices.

http://www.manexconsulting.com/index.php
As a member of the National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership (MEP) program, the Corporation for Manufacturing Excellence (Manex) draws upon a national network of resources covering broad expertise in manufacturing best practices.

http://www.cmtc.com/
California Manufacturing Technology Consulting, also a NIST MEP member, provides manufacturing and distribution consulting services in a number of specialized areas, including aerospace and defense, and distribution and logistics.

http://seaonline.org/index.htm
The Supplier Excellence Alliance is comprised of aerospace, defense, and space primes/OEMs, major subcontractors, and suppliers working together to accelerate supply chain performance.

http://www.apics.org/default.htm
APICS, The Association for Operations Management, is a global leader and premier source of the body of knowledge in operations management, including production, inventory, supply chain, materials management, purchasing, and logistics. It offers a Certified Supply Chain Professional certification.

http://www.ndia.org/
The National Defense Industrial Association (NDIA) provides individuals from academia, government, the military, small businesses, and prime contractors the opportunity to network effectively, keep abreast of the latest in technology, and address defense-related issues.

http://www.californiaspaceauthority.org/
The California Space Authority (CSA) was the lead on a Workforce Innovation in Regional Economic Development (WIRED) grant from the U. S. Department of Labor. Part of this grant involved a "smart supplier" initiative, whose purpose was to characterize foundation "smart supplier" competitiveness skills. For information on the WIRED grant initiatives, see: http://www.innovatecalifornia.net/.

http://www.avc.edu
Antelope Valley College was a partner in the WIRED "smart supplier" initiative and co-sponsored a seminar on 21st Century Supply Chain Management.

http://www.l5ps.com/
L5 Performance Systems was a partner in the WIRED "smart supplier" initiative and is responsible for the formulation and development of the Supplier Excellence Alliance, the only aerospace, defense, and space prime contractor alliance for the development of supply chains across the entire industry.

http://wesrac.usc.edu/
The Western Research Application Center (WESRAC) was a partner in the WIRED "smart supplier" initiative. WESREC is a research center at the USC Viterbi School of Engineering organized to bring technical assistance to organizations in the USC community.

Supply Chain/Logistics Publications *(print and electronic)*

APICS Magazine	www.apics.org
Global Logistics & Supply Chain Strategies	www.e-circ.net/gsl/cs.asp
Inbound Logistics: The Magazine for Demand-Driven Logistics	www.inboundlogistics.com
Logistics Management	www.logisticsmgmt.com
Modern Materials Handling	www.mmh.com
Purchasing.com – The Magazine of Procurement & Supply Chain	www.purchasing.com
RFID Journal	www.rfidjournal.com
Supply & Demand Chain Executive	www.sdcexec.com
Supply Chain Daily	www.supplychaindaily.com
Supply Chain Digest	www.scdigest.com
Supply Chain Management Review	www.scmr.com
World Trade Magazine	www.worldtrademag.com

Articles/Papers

Forging New Partnerships: How to Thrive in Today's Global Value Chain
http://www.nam.org/s_nam/bin.asp?CID=216&DID=239787&DOC=FILE.PDF

Free The Enterprise! Bust the Silos in the Supply Chain!
http://www.supplychainbrain.com/content/headline-news/single-article/article/free-the-enterprise-bust-the-silos-in-the-supply-chain/

Information on Federal Programs and Interagency Efforts That Support Small Businesses Engaged in Manufacturing (GAO)
http://www.gao.gov/new.items/d07714.pdf

See also supplychainbrain.com for a wealth of other relevant articles and white papers.

Workforce Development

http://www.calwia.org/
California's 49 Local Workforce Investment Areas (LWIAs) are designated by the Governor based on population and commonality of labor market. Each LWIA is administered by a Local Workforce Investment Board (LWIB), comprised of representatives from private sector businesses, organized labor, community-based organizations, local government agencies, and local education agencies. LWIBs provide policy guidance, designate operators for their areas' One-Stop Career Centers, and oversee the job training activities within their local areas. The over 200 One-Stop Career Centers throughout California are available at no charge to assist with solutions to workforce issues, including hiring, training resources, and layoff assistance.

http://www.calworkforce.org/index.html
The California Workforce Association is a non-profit membership organization that develops public policy strategies and builds local capacity to address critical workforce issues. CWA represents the 49 Workforce Investment Boards, over 200 One-Stop Career Centers and other workforce development partners in California.

http://www.edd.ca.gov/Jobs_and_Training/Hire_Workers.htm
The California Employment Development Department (EDD) offers a job listing service (CalJOBS) and labor market information targeted to the needs of California's businesses.

Education and Training

In general, all public colleges in California have some training available in SCM and Logistics. Most offer a certificate or degree program that focuses on SCM (some also have advanced programs). Below are the general information links to California's public college systems. This is obviously not a complete list for possible training, but SCM training is widely available in all areas of the state. When arriving at the main site for a school, the user then just does a search for supply chain or logistics to get to the program information.

University of California system
www.universityofcalifornia.edu
Lists and links to the 10 universities in the UC system.

California State University system
www.calstate.edu
Lists and links to the 23 universities in the CSU system.

Note: *CSULA offers a bachelor degree with emphasis in manufacturing engineering.*
See http://www.calstatela.edu/academic/ecst/engr/mnf/.
CSULB also offers a degree in manufacturing engineering technology.
See http://www.csulb.edu/colleges/coe/mae/views/programs/undergrad/bs_met.shtml.

California Community College system
www.cccco.edu
Lists and links to the 110+ community colleges in the CA system.

https://misweb.cccco.edu/webproginv/prod/invmenu.htm
The California community college system provides a searchable inventory of approved degrees and certificates offered at all of the state's community colleges.

www.cact.org
There are 12 Centers for Applied Competitive Technologies strategically located across California that receive funding from the California Community College's Chancellor's office to develop innovative solutions to help advanced technology companies compete.

http://www.cccewd.net/index.cfm
The Economic & Workforce Development program of the California community colleges helps to facilitate education and training for workers and business owners in emerging industries.

http://www.cvc.edu/students/courses
The California Virtual Campus is a searchable inventory of online classes offered by colleges across California.

http://www.cmtc.com/news.html
California Manufacturing Technology Consulting (CMTC) holds topical events throughout the year geared towards manufacturers. These events range from Identifying Energy Efficiencies on the Plant Floor to ISO 9000 Consortia.

http://www.manexconsulting.com/page.php?id=5
The Corporation for Manufacturing Excellence (Manex) hosts and participates in various industry events and conferences.

http://seaonline.org/Briefings/index.html
The Supplier Excellence Alliance hosts workshops and forums for its members.

http://www.apics.org/Education/
APICS, The Association for Operations Management, offers a number of educational programs, including conferences, webinars, workshops, and self-study resources. It also offers the Certified Supply Chain Professional certification.

http://www.sme.org/cgi-bin/getgmnpage.pl?/html/professional_development.htm&&&SME&
The Society for Manufacturing Engineers offers many professional development opportunities through training programs, certification, and online courses.

http://cscmp.org/education/education-lp.asp
The not-for-profit Council of Supply Chain Management Professionals provides on-site and online professional development workshops and training. Part of its website is devoted to resources for academics involved in the supply chain discipline.

http://www.supplychainseminars.com/
Supply Chain Seminars offers in-house, customized, faculty-led seminars in Integrated Supply Chain Management, and its Supply Chain Online division offers a web-based course, Fundamentals of Supply Chain Management.

http://www.nextlevelpurchasing.com/purchasing-professionals.html
Next Level Purchasing offers training for purchasing professionals in supply chain management and the Senior Professional in Supply Management certification program.

http://www.ism.ws/education/?navItemNumber=4888
The not-for-profit Institute for Supply Management offers seminars and professional development services, from off-the-shelf to fully tailored programs.

http://www.worldwidelearn.com/business-course/supply-chain-management-course.htm
WorldWideLearn is a directory of online courses in contract management, supply chain management and logistics.

http://www.ed2go.com/cgi-bin/ed2go/newofferings.cgi?dept=BM
ed2go offers online courses in many disciplines through local colleges; its business administration offerings include supply chain management fundamentals and distribution and logistics management.

http://ocw.mit.edu/OcwWeb/Sloan-School-of-Management/15-763JSpring-2005/CourseHome/index.htm
MIT offers open courseware – free publication of MIT course materials, including lecture notes and readings. The link is to the Manufacturing System and Supply Chain Design course.

http://www.labormarketinfo.edd.ca.gov/?pageid=1013
The Employment Development Department (EDD) maintains a comprehensive database of training providers and programs in California.

http://www.etp.ca.gov/
The Employment Training Panel (ETP) is a business and labor supported state agency that assists employers in strengthening their competitive edge by providing funds to offset the costs of job skills training necessary to maintain high-performance workplaces.

Case Studies

http://www.supplychainbrain.com/content/the-library/
This site's library of reports and case studies is extensive

http://resources.bnet.com/topic/aerospace+and+supply+chain.html
Recent presentations and reports on aerospace and supply chain

Events

http://www.supplychainbrain.com/calendar/index.cgi
Supply Chain Brain calendar of events (searchable database)

http://www.supply-chain.org/cs/root/events_calendar_education/events_calendar/events_calendar
Supply Chain Council calendar of events

http://cscmp.org/events/all-events.asp
Council of Supply Chain Management Professionals calendar of events

http://www.cmtc.com/news.html
California Manufacturing Technology Consulting (CMTC) holds topical events throughout the year geared towards manufacturers. These events range from Identifying Energy Efficiencies on the Plant Floor to ISO 9000 Consortia.

http://www.manexconsulting.com/page.php?id=5
The Corporation for Manufacturing Excellence (Manex) hosts and participates in various industry events and conferences.

http://seaonline.org/Briefings/index.html
The Supplier Excellence Alliance hosts conferences and forums to share best practices.

http://www.sme.org/cgi-bin/events_expos.pl?/html/event_expo_hp.htm&&&SME&
The Society for Manufacturing Engineers produces a variety of industry-leading events to provide manufacturers with forums to interact, exchange ideas, evaluate equipment, and sharpen their skills.

www.rfidjournalevents.com
RFID Journal calendar of events

http://www.aia-aerospace.org/aianews/calendar.cfm
Aerospace Industries Association calendar of events

http://www.amrresearch.com/events/default.asp
AMR Research Supply Chain calendar of events

http://lean.mit.edu/index.php?option=com_events&Itemid=417
LAI – MIT calendar of events

http://ndia.org/Template.cfm?Section=Meetings_and_Events
The National Defense Industrial Association (NDIA) offers the opportunity to increase knowledge and contacts through its network of divisions and chapters and over 80 technical and policy symposia and convention-exhibit programs each year.

Supplier Network Transformation Assessment

Lockheed Martin Lean Self-Assessment
The assessment has been specifically designed to assess a company's present level of maturity in Lean implementation by examining its current practices relative to several components of Lean.

Manufacturing and Quality Processes

http://www.manufacturingnews.com/
Manufacturing & Technology News covers the most important subjects involving manufacturing, research and development, international competition and government policies. It covers the electronics, aerospace, automotive and machine tool industries.

http://www.nacfam.org/
The National Council for Advanced Manufacturing (NACFAM) is an industry-led, policy research organization, working make U.S. manufacturing globally competitive. It convenes its members and other key stakeholders to identify, research, formulate, and communicate proposals in a non-partisan, non-lobbying environment.

http://www.mep.nist.gov/index.html
The Manufacturing Extension Partnership (MEP) provides its manufacturing customers with a wide array of fundamental services in business and process improvements helping them to stay strong and ready to compete in the global market.

Quality Assurance and Documentation

http://www.asq.org/
The American Society for Quality (ASQ) advances learning, quality improvement, and knowledge exchange to improve business results, and to create better workplaces and communities worldwide. ASQ offers technologies, concepts, tools, and training to quality professionals, quality practitioners, and everyday consumers.

http://www.iaqg.sae.org/iaqg/
The International Aerospace Quality Group (IAQG) is a worldwide cooperative organization of prime aerospace industry companies which pool and exchange their experiences to jointly develop processes and standards for high quality products.

http://www.pri-network.org/
Performance Review Institute (PRI) is a not-for-profit organization. It exists to advance the interests of the mobility and related industries through development of performance standards and administration of quality assurance, accreditation, and certification programs and related activities.

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