

Creating an Innovation Practice: A Guide to Manufacturing Workforce Systems and the SMARTalent Tool



Innovation is at the core of what MEP does and, as such, serves an essential role in sustaining and growing America's manufacturing base. Innovation engineering and other critical business processes assist manufacturers' growth strategies for reaching new markets, manufacturing new products and, ultimately, job creation. Next generation strategies for manufacturers include: technology acceleration, sustainability, supply chain, continuous improvement and workforce.

Manufacturers know they must focus on these strategies to ensure growth. However, workforce development is often an afterthought. Historically misunderstood, the workforce has been seen as fungible and expensive. The development of Scientific Management in the 1950s, based on the supposition that manufacturing workers need not think, but just "do", relegated the human capital element of manufacturing to simply just another input.

Not so today. Today, all manufacturing employees need to have soft skills as well as technical skills, including emotional intelligence, communication skills, strength in cognition and analysis, business acumen, and creative problem-solving skills. Supervisors are leaders, not just technicians, and are required to be mentors, not simply bosses. Front-line workers can be valued for their ideas, not just their output and, these days, as productivity reaches its highest levels ever, should be recognized for their intrinsic value – something most often seen as intangible and unquantifiable.

It's hard to parse the tangible value of employees (labor) from the intangible value they create (ideas, productivity, innovation, customer goodwill) because we traditionally don't use accounting measures that capture that value (although we can). We write off recruitment, training, wages, salaries and benefits as expenses and don't think of them as investments similar to our capital investments in technology, facilities, marketing or supplies that can be amortized over time and with innovation and growth in mind. Jonathan Low and Pam Cohen Kalafut¹ describe in their list of intangibles to company performance that relationships, human capital, intellectual capital and workplace organization, and culture all affect business outcomes. It seems irresponsible to ignore them in this competitive global economy and to not align and integrate our workforce systems with our other business/production systems.

Nonetheless, manufacturers often do not think of their workforce and human resource processes as a system; they miss many of the basics of workforce development despite its value to their bottom line:

- Job descriptions are often outdated creating a mismatch

¹ Low, Jonathan and Kalafut, Pam Cohen. *Invisible Advantage: How Intangibles are driving Business Performance*. Cap Gemini Ernst Young 2002

when finding workers for positions that have changed over time;

- Talent pipeline partnership opportunities with education and training providers are not fully utilized;
- There is a failure to think about strategic workforce needs rather than today's employment crisis;
- Too little investment in the on-the-job training obstructs the technology and process innovations manufacturers must have to remain competitive; and
- Most workforce investments are narrowly defined and are not systematically connected to business performance, the economic health of employees and the communities in which businesses exist and employees work. Data and analytics to analyze workforce investments are rarely used.

All manufacturing investments must be woven together into strategic planning and decision-making to move from a tactical approach to a strategic one, from being reactive to pro-active, and to defining value and implementing corollary actions instead of chasing yesterday's products and their declining revenues. Innovation and workforce development are inextricably linked. One look at the Harvard Business School Curriculum shows that innovative strategies and disruptive ideas are the result of a combination of people and organizational culture and processes. Doug Conant, former CEO of Campbell Soup believes that to stimulate innovation, "the action is in the interaction."

IBM, in its publication, *Getting Smart About Your Workforce: Why Analytics Matter*, describes the importance of workforce data collection and analysis. Their survey findings explain why workforce analytics are a key capability for driving business strategy and how the implementation of workforce analytics is hindered by technical and skill related issues. Without data, decisions will always be flawed. Systematizing workforce development reduces unnecessary risk and speeds good decision-making. The value of this data cannot be overstated. A 2012 report from the Georgia Institute of Technology and the University of California San Diego states that the value of information in manufacturing, through data collection, is rapidly rising and becoming more integral to process and product innovation.

NIST MEP recognizes that change is neither simple nor without cost. But with the SMARTalent tool, MEP will help promote the adoption of 21st century business strategies and tools. As a result of these efforts – and aligned with the new CORE metrics and Innovation Engineering – MEP centers and their clients will increase their capacity for innovation and see growth in line with those investments

What a Workforce System Means for Manufacturers

Manufacturers who analyze their workforce investments in ways similar to their other business investments (process control, inventory management, product development, finance and accounting) will find that their use of diagnostics for workforce development will provide them with:

- **Greater Productivity:** Employees' skills will become better aligned to the skills needed by the company, resulting in greater effectiveness and efficiency in their operations.
- **Better Trained Employees:** As skill needs and requirements become standardized, and employers gain more and better access to training customized to those requirements, employees will be better-trained in industry-specific skills aligned to business goals.
- **Reduced Turnover:** With a focus on workforce development as a system, employees will be better matched with their job descriptions, and with access to training and career ladders, and they will be more inclined to stay where there are opportunities for advancement.
- **Better Pool of Job Applicants:** As more community or regional resources are devoted to training people in the appropriate skills needed for the company and industry, the pipeline of qualified applicants will expand to support business growth.
- **Cost Offsets:** As productivity goes up, turnover goes down, processes become more efficient, and barriers to productivity are reduced. With a workforce system in place, workforce investments are optimized and risks minimized.

To be positioned not just for survival but for competitive growth, manufacturers must focus on the five critical Next Generation Strategies in their business model: Sustainability, Supply Chain, Workforce, Continuous Improvement and Technology Acceleration. Each of these strategies must be planned and executed in alignment with the other strategies within the business. While a company might be more proficient in one strategy than another, the absence of even one critical strategy from a business model (or its non-integration with the other strategies) will create weaknesses in the business model and, eventually, loss of competitiveness. At right, one can see that each strategy has the same components (business goals, technology support, culture, outcomes, etc). However, each strategy has a unique set of system processes that support the strategy and are specific to that strategy.

Manufacturers will share responsibilities, however, for achieving these kinds of outcomes. They must:

- **Identify Desired Goals and Outcomes for Their Company:** They must get serious about planning innovation and growth strategies and the specific outcomes they want to achieve, and how their workforce will support those outcomes.
- **Review Internal Processes for H.R. and Training:** Manufacturers should create an environment of continuous learning. Their company culture should reinforce workforce development. They should pay market wages. They should have career ladders. They should conduct employee satisfaction surveys annually.
- **Communicate Expectations and Provide Honest Feedback:** Are employees aware how their performance impacts business goals? Are employees getting the feedback they need to do the best job possible?
- **Provide Access To and Understanding of The Company and Industry:** Training partners won't know about a manufacturer's business needs unless the manufacturers can provide accurate job descriptions and skills needs, and allow for mentorships, apprenticeships, internships and career events to get everyone aware of 21st century manufacturing and its great jobs.
- **Gather Data to Evaluate Efforts and Quantify Successes:** We all know the saying: "What gets measured is what matters". Analytics are a must.
- **Be A Champion for Workforce Development:** Manufacturers and MEP Centers should speak out on the importance of workforce development and workforce system analytics, and get involved in value-added activities that will make change happen.



Sustainability System Processes Include: lean and quality implementation, no-waste or green manufacturing, reduced energy consumption, alternative materials, community stewardship, measurable sustainability metrics, annual or shareholder reports that include corporate social responsibility initiatives.

Supply Chain System Processes Include: supplier partnerships, shared technology, knowledge and goals, insourcing expertise, win-win mindset, supplier ecosystem development and support.

Workforce Systems Processes Include: career ladders, competitive wages and benefits, training opportunities, mentorships/internships/apprenticeships, analytic human resource planning including forecasting and recruitment, periodic job analyses and updated job descriptions, performance standards and metrics, and organizational policies that reflect social norms and the organization's culture.

Continuous Improvement System Processes Include: lean and quality implementation, ideation, leadership at all levels, problem-solving, team or cell-work, culture of innovation, flexible management, asset mapping, export and market growth, development of patents and intellectual property.

Technology Acceleration System Processes Include: enhanced use of advanced hardware, software and cloud computing, innovation engineering, venture financing, commercialization, industrial marketing, external and internal data capture for analysis and reporting outcomes.

SMARTalent

How does SMARTalent Work?

If manufacturers are to engineer innovation in their businesses, workforce development investments will need to evolve from a one-off transactional type of activity (let's train in Lean this year) to a business strategy integrated with plans for next generation strategies (what kinds of skills do we need to become a world-class manufacturer and expand our markets?). The cycle of business planning for workforce investments can be understood in the graphic on the right. Each component is followed by the type of activity that manufacturers must consider in their workforce planning process.

Planning and Strategic Alignment

1. Develop Business Vision
2. Operationalize Vision: Identify Skill Needs
3. Perform Skills Gap Analysis: Current versus Future Desired Skills
4. Implement Workplace Reorganization and Training
5. Assess and Evaluate Effectiveness of Plans as Business Strategy

Recruitment

1. Develop Job Profiles Aligned with Skill and Competency Demands
2. Identify Necessary Educational or Training Credentials for Skill Verification
3. Inform Community Partners of Skill Demands and Trends
4. Monitor Position Description Changes as Business Shifts

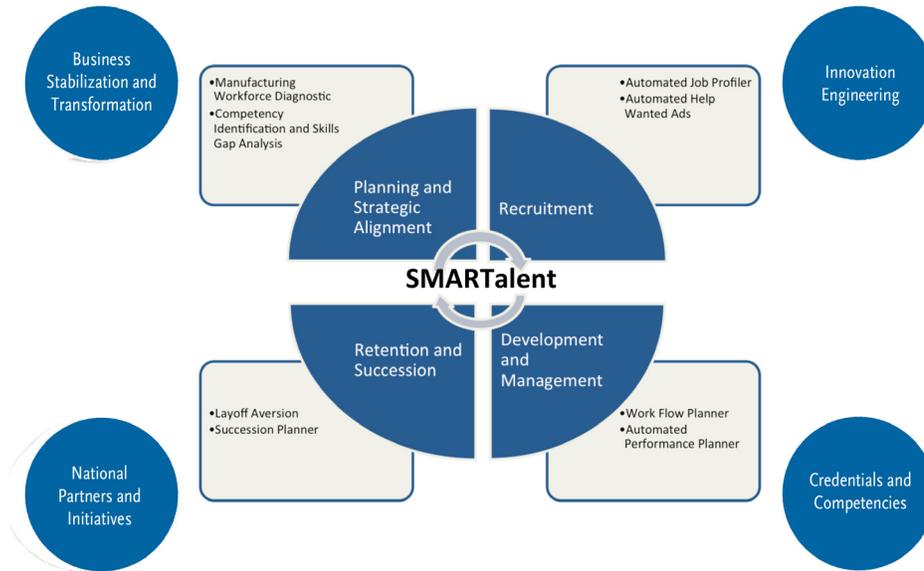
Development and Management

1. Define Performance Specifications in Line with Job Descriptions
2. Plan for Work Flow and Staffing Assignments
3. Ensure Access to Skill and Career Information for Employees
4. Provide Workforce Development Opportunities
5. Define and Quantify Return on Investment to Workforce Development
6. Ensure Human Resource Policies Support Organizational Goals and Employee Needs
7. Work with Community Providers on "Talent Pipelines"

Retention and Succession

1. Provide Career Pathways and Career Mobility as well as Commensurate Pay/Benefits
2. Develop and Implement Leadership and Succession Plans
3. Solicit Feedback from Employees and Customers on Satisfaction
4. Periodically Reassess What Success Means
5. Define and Quantify Return to Workforce Development as a Business Investment
6. Adjust Accordingly





To the left is the conceptual image the SMARTalent management tool MEP is developing to help operationalize the basic functions of a workforce development system.

How to be a SMARTalent Expert (and Optimize its Use)

In order to optimize manufacturers' investment in the NIST MEP SMARTalent system, you may want to first answer some questions about your Center:

Questions	Yes	No
Our center values and invests in learning and development for all staff	___	___
Our center promotes effective collaboration, team work and access to knowledge sharing	___	___
Our center has good communication among its staff	___	___
Our center eliminates barriers to staff performance	___	___
Our center's work is well defined and allows staff to do their jobs well	___	___
Our center engages in continuous improvement in its operations	___	___
Our center staff are asked to demonstrate our professional values at all times	___	___
Our center annually plans for innovation and growth	___	___
Our center's jobs are profiled and staff skills match the job profiles	___	___
Our center's job profiles support our innovation and growth goals	___	___
Our center's human resource policies are fair and equitable	___	___
Our center has a leadership program for staff	___	___
Our center has a succession plan in place	___	___
Our center analyzes the tangible and intangible value of our workforce to our business	___	___

These questions are much the same ones that your manufacturing clients will need to ask of themselves. The SMARTalent tool will provide an automated system for inputting information and for drawing analytical conclusions based on the information companies enter. Yet, there remains a need for manufacturers to understand how to gather important information in order to enter it into the system, especially if this information is not easily accessible due to myriad systems or process owners. Therefore, knowledge of workforce development is critical to the successful implementation of the SMARTalent tool. If your Center does not have a workforce expert on staff, you should consider partnering with one to provide technical assistance. The American Society for Training and Development (www.astd.org) has training consultants (and professional chapters) in every state, and their members are highly qualified to help you with your clients.

SMARTalent *continued*

Additionally, your local community college may have expertise in job profiling, and ACT (a partner in the NAM Skills Certification System) has experienced job profilers ready to help businesses start the process of skill and competency identification linked to job position (<http://www.act.org/workforce/research.html>). Additionally, you may want to contact NIST MEP or other MEP Centers that have workforce experts on staff to better understand an approach that works best for you.

Training Scorecard

This simple Training Scorecard should be viewed as a snapshot of usage in four Workforce System Categories. Scores for each (Not Observed=1; Sometimes = 2; and Always = 3) should indicate an **overall score of usage for all components** and demonstrate where improvements can be made. A total score of less than 30 indicates a need to revisit training policies and practices to modernize the company's strategic approach to competitiveness. The **Actions to Take** column describes some immediate actions that can be taken if the company scores low.

	Not Observed	Sometimes	Always	Score	Action to Take
COMPANY COMMITMENT					
Is training considered as a component for the business strategy?					Review business strategy to understand employee skill needs in light of production goals.
Is company time devoted to training annually?					Ensure time is devoted to providing skills acquisition whether on the job, online or in the classroom.
Do H.R. policies reflect the need for business-aligned training policies and employee career mobility?					Review human resource policies and practices to align skill acquisition with business practices and employee remuneration.
Are training funds available through an annual budget process?					Determine best method for funding training, e.g. operations budget, H.R. budget, CSR budget, special allocations, collaborative funding with partners and publicly available training funds.
EMPLOYEE AWARENESS					
Are company goals clear to all employees (production, customer satisfaction, quality, growth)?					Communication (written, online, verbal) should be available, standardized and regularized to ensure understanding of company demands and opportunities.
Do employees understand how individual and team performance is linked to company goals?					Hold open forums of employees for discussing business issues and how they can support them.

	Not Observed	Sometimes	Always	Score	Action to Take
<p>Are employees aware of skills needed to do their jobs?</p> <p>FRONTLINE LEADERSHIP</p> <p>Does the company offer mentorships, OJT, and/or apprenticeships?</p> <p>Are supervisors offered training in skills such as leadership, motivation, praise, delegating, organizing, communication, and teamwork?</p> <p>Does the company assess supervisor performance with input from peers?</p> <p>Do all employees understand their role in continuous process improvement and their part in making the company successful?</p> <p>INNOVATIVE THINKING</p> <p>Does the company participate in partnerships with training providers such as community or technical colleges?</p> <p>Does the company participate in consortia of employers to aggregate training needs and provide customized training?</p> <p>Does the company hold membership in the local MEP, chambers or business associations to represent industry needs/skills/economic growth?</p>					<p>If few to no training opportunities exist, reconsider offering them either by the company or in partnership with other employers or training providers.</p> <p>Contact local Department of Labor office or manufacturing extension program (MEP) office for information about apprenticeships.</p> <p>Develop a mentorship program that can be used on the job and extend to all employees and, potentially, interns, summer hires, high school students and others to develop a talent pipeline</p> <p>Develop performance reviews that incorporate feedback from all employees so that a collaborative, open and trusting working environment is encouraged.</p> <p>Discuss principles of lean, quality, ISO and blackbelt</p> <p>Get to know the head of workforce development at the local community or technical college, and describe to them your workforce challenges.</p> <p>Join the employer council of the local workforce partnership and describe to them your workforce challenges, including funding for training.</p> <p>Join the local MEP, chamber or business association and help them understand that business growth is dependent on local residents' skills.</p>

How to Get Started

Throughout 2012, several MEP Centers are helping “test pilot” the functionality and value of the SMARTalent tool. NIST MEP will provide periodic updates to all Centers that describe the progress of the pilots and how the Centers are conceptualizing its use, including monetization. While this is occurring, all Centers are encouraged to investigate how workforce development and talent management are critical to supporting the growth of manufacturing businesses, and its integration into strategic business planning.

This begins with an understanding of :

- 1) a client’s products and services,
- 2) their business model and competitive position,
- 3) their growth plans including new products and new markets,
- 4) obstacles to growth such as a dearth of skilled workers, supply chain bottlenecks or lack of new customers, and
- 5) their financial position.

Within this mix, it will be important to align the skills already existing in the manufacturing workplace and the skills needed for current as well as future business growth. By mapping operations to the workforce, and then to the business plans, manufacturers will have a clearer understanding of the investments they need to make in their workforce (e.g. skills training, recruitment, wage alignment, equitable human resource practices, innovation culture) to ensure that operations run smoothly. From that strategic vantage point, training and other workforce programs can then be initiated as needed, and assessed for return on investment.

To get help with strategic workforce planning, SMARTalent or simply to receive more information about workforce systems development at NIST MEP please contact Stacey Wagner at:

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