



USING COMPETENCY
MODELS TO DRIVE
COMPETITIVENESS

**and combat the
manufacturing
skills gap**



TOOLINGU





MANUFACTURERS ARE CHALLENGED By Lack of Skilled Workers¹

[64%]

of manufacturers say productivity losses are a result of a skills gap.

[41%]

cited quality losses.

[56%]

report the gap in skilled labor has impacted their company's ability to grow.

[78%]

cited a lack of qualified candidates as one of the top two factors that impacted their ability to hire a skilled workforce.

[54%]

of manufacturers do not have a companywide plan for addressing their skills gap.

[18%]

of companies have defined workforce roles in terms of written job roles, competencies (skills and behaviors), experiences, education, cognitive abilities, motivation factors and cultural fit.

SKILLED WORKERS – A National Priority

Access to skilled workers is the number one driver for a country's competitiveness² Yet U.S. manufacturers are challenged to find the talented workforce needed to fill good jobs currently available, much less in the future. Addressing this issue is critical because keeping the manufacturing engine going and growing is important for a strong U.S. economy.

Creating a robust pipeline of workers to address the needs of U.S. manufacturers has become a national priority. In January 2014, President Barack Obama signed a presidential memorandum to initiate an across-the-board review of America's federal training programs.³ Additionally, recent government investments in manufacturing innovation institutes as well as a new \$450 million round of the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grants Program⁴ demonstrate the commitment to solving these workplace issues.

While government, academic institutions and industry all agree on the importance of well-trained, motivated workers to fuel an organization's – and the country's – productivity and growth, increased alignment between all three groups can accelerate solutions for addressing the skilled labor gap.

For their part, some manufacturers are increasingly turning to competency models – a structured system to develop the needed knowledge, skills and abilities for specific jobs – to build the high-performance teams they need to meet the demands of their current business environment as well as in the future. With manufacturing production growth forecast⁵ at 3.2 percent in 2014 and 4.0 percent in 2015, this is especially important.

In this report, Tooling U-SME, an industry leader in manufacturing training and development, explores the skills gap, defines competency models, analyzes the need and benefits of competency modeling, explains different types of models and explores best practices.

For their part, some manufacturers are increasingly turning to competency models to build the high-performance teams they need to meet the demands of their current business environment as well as in the future.

THE SKILLS GAP & the Ticking Clock

Companies of all sizes are now looking closely at competency models as a way to address the skilled labor gap. While the exact number of unfilled jobs is debatable, there is no doubt manufacturers are suffering from a lack of qualified workers. ManpowerGroup's ninth annual Talent Shortage Survey puts skilled trades at the top of the list of both global and U.S. hardest jobs to fill in 2014.⁶

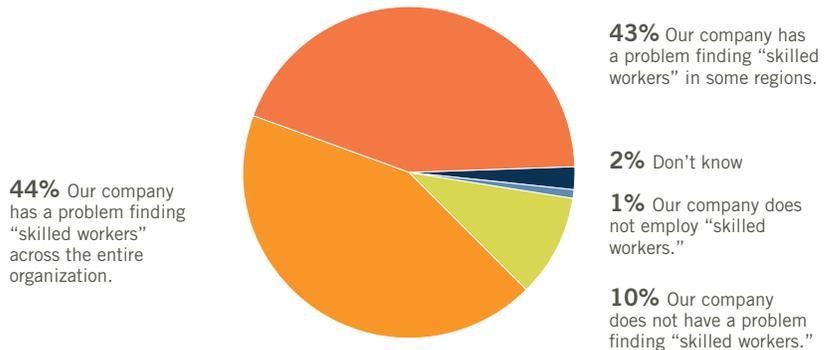
Currently, 9 out of 10 manufacturers are having difficulty finding skilled workers and they say this is directly hurting the bottom line, according to an SME survey.¹ In fact, 64 percent of survey respondents said productivity losses were one of the top two performance indicators impacted by a lack of skilled labor. In addition, nearly 60 percent of the survey respondents said the gap in skilled labor impacted their company's ability to grow.

While the skilled worker shortage is being felt now, the impact is expected to be even greater at the end of the decade. According to The Boston Consulting Group (BCG),⁷ without aggressive action, the next decade is expected to bring a potential shortfall of 875,000 machinists, welders, industrial-machinery mechanics, and industrial engineers.

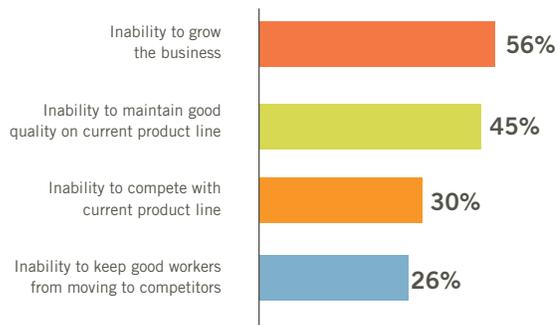
There are four primary reasons for this lack of skilled workers:

- Limited pipeline – There has been a decline in people pursuing Science, Technology, Engineering and Math (STEM) education and younger generations are less drawn to a career in manufacturing.
- Retiring workforce – As baby boomers are hitting retirement age, valuable experience and skills go with them. The oldest baby boomers turned 65 on January 1, 2011 and every day since, for the next 19 years, about 10,000 more will hit that milestone.⁸
- Changing pace of technology – At no other time has technical innovation moved so quickly. This is great news for growing companies, but it can be a challenge for workers who are unable to keep pace and are left behind.
- Reshoring – This movement to bring manufacturing back to the U.S. creates an even bigger demand for jobs.

Please describe your current hiring challenges as they relate to skilled workers.



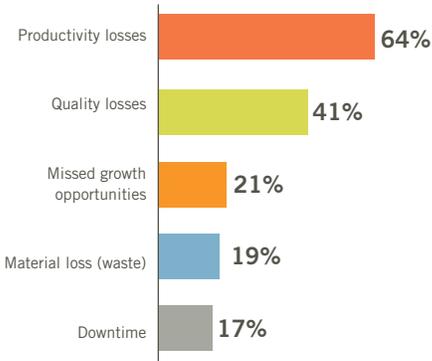
What are the top two areas of business impact in your organization that are most affected by a "skills gap?"



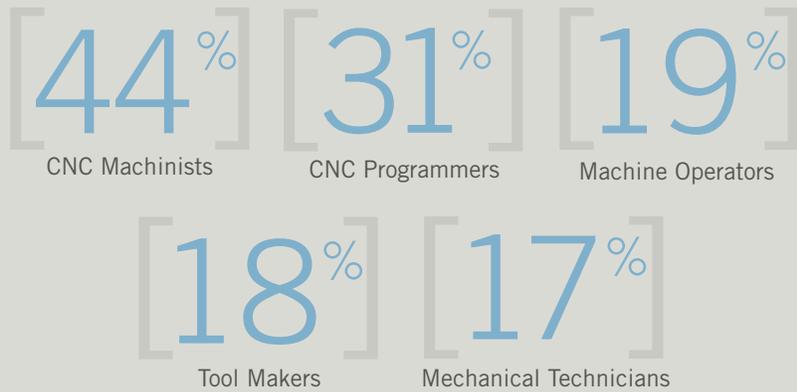
The Boston Consulting Group (BCG) report includes an agenda for a 21st Century manufacturing talent base. In its recommendations, among others, BCG states that manufacturing companies should return to the historical practice of investing in internal training programs in order to build the capabilities they will require to remain competitive.



What are the top two key performance indicators in your organization that are most affected by a “skills gap?”



**SKILLED WORKERS
Most in Demand¹**



THE BUSINESS CASE for Competency Models

By instituting a training program, including competency models, tied directly to the bottom line, companies can ensure they remain competitive today and into the future. Creating a well-trained workforce can help improve quality, cycle time, communications, reliability and safety, while reducing costs and downtime/rework.

Yet despite these tangible business benefits, more than half of manufacturers say they do not have a plan in place to address the skilled labor shortage.¹

While employers invest in equipment, tooling and materials, they often neglect to make a similar investment in their employees. However, if workers do not keep up with technological advances, the whole structure moves out of balance. A well-trained employee will more effectively utilize the capability of new equipment, leading to increased innovation and productivity.

Competency models are one way to develop systems that allow people coming into the manufacturing environment as well as the incumbent workforce to have the needed knowledge, skills and abilities for specific jobs.

A study by Bersin & Associates, “Key Findings – Becoming a High-Impact Learning Organization” (2012), indicates that high-impact learning organizations are better able

to drive value from a well-designed, well-adopted and sustainable use of job/role profiles and competency frameworks.

The study found that effective use of profiles and competencies provides a common language to describe talent throughout the organization. This language allows productive conversations in areas, such as skills gaps, performance management,

talent acquisition and leadership development.

The results showed high-impact learning organizations are better than their counterparts overall at integrating their talent processes and each process is likely to be more mature.

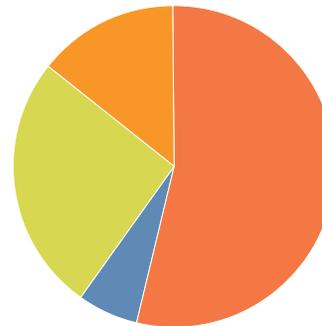
There is plenty of opportunity for industry to take advantage of these benefits as a recent Tooling U-SME informal poll⁹ of manufacturers

Does your organization have a company-wide plan in place for addressing your skills gaps?

14% Yes, we have a company-wide plan filling our skills gaps among skilled workers in critical roles through the next 5 years.

26% Yes, we have a company-wide plan for filling our skills gaps among skilled workers in critical roles through the next 12 months.

6% Don't know



54% No, we do not have a company-wide plan in place for filling our skills gaps among skilled workers in critical roles at this time.

“Progressive companies like ours that embrace the competency models, implement them and then use them for the selection, development and appraisal process will jump ahead of the competition.”

Jerry Kaminski, senior organizational development specialist for American Axle.

indicates 68 percent of companies do not leverage competencies for their technical workforce. It is encouraging to note, however, that about half of those said they have a current business initiative to implement competencies.

According to another survey,¹ while 71 percent say their skilled workforce training programs are built on specified competencies defined in job roles, only 1 in 5 companies have defined workforce roles in terms of written job roles, competencies (skills and behaviors), experiences, education, cognitive abilities, motivation factors and cultural fit.

This lack of documented competencies across job roles in manufacturing creates difficulty in targeting training and performance metrics to achieve competencies. It also slows everything down. Putting this structure in place is paramount to enable high-performing workers to achieve business goals.



COMPETENCY VS. Competency Model

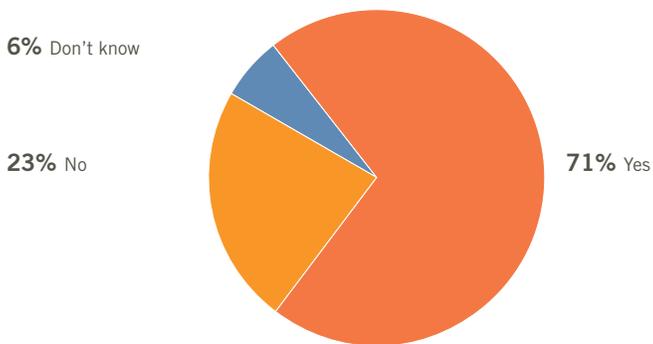
What is a competency?¹⁰

- ▶ The capability to apply a set of related knowledge, skills, and abilities (KSA) to successfully perform functions or tasks in a defined work setting.
- ▶ Competencies often serve as the basis for skill standards that specify the level of KSAs needed for success, as well as potential measurement criteria for assessing competency attainment.
- ▶ A competency framework is used to design a plan specific to a particular manufacturing environment or organization or when there are no manufacturing certifications tied to desired job roles.

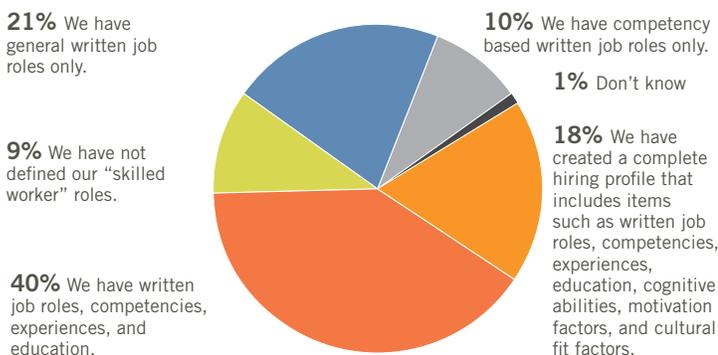
What is a competency model?¹⁰

- ▶ A collection of competencies that together define successful performance in a particular work setting.
- ▶ Competency models are the foundation for important human resource functions such as recruitment and hiring, training and development and performance management.
- ▶ Competency models can be developed for specific jobs, job groups, organizations, occupations or industries.

Are your organization's skilled workforce training programs built on specified competencies defined in job roles?



Which of the following best describes your company's current approach to defining "skilled worker" roles?



VALIDATION & Documentation

Over the years, the training process has become much more sophisticated. Years ago, companies might check a box to indicate training had been completed. Today there are significantly more rules, regulations and documentation. For instance, think about the more stringent guidelines for ISO certification.

Also, today it's necessary to validate that knowledge has been transferred – not just that a class has been completed. Manufacturers want to know that an employee is able to apply the knowledge provided in the class to their everyday responsibilities on the job. Another change is that organizations are looking at employees individually and building customized training programs specifically to fit their strengths and weaknesses. Training is no longer one size fits all.

All of this is increasing the sophistication of the whole system and adding pressure on manufacturers to keep up. For instance, some of the standards include:

ISO Quality Standards & Certification

Many manufacturers are implementing an ISO quality management system, which outlines specifically what to look for in a talent management system. This includes building and documenting a system to identify competency requirements for employees and then helping to fill skills gaps to reach these goals.

Companies are finding that competency models provide the rigor needed to meet the ISO quality objectives, guidelines and reporting requirements. In particular, *Section 6.2.2.e, Maintaining Training Records* sets the standards required by organizations to maintain records of education, training, skills and experience. A good competency model will map to a strong blended training program covering everything from e-learning to certifications, and track employee progress.

“Every year, managers, or ‘coaches’ as we call them, sit with associates for a competency review. The purpose is to develop meaningful knowledge, not measure how many classes have been taken in a specific amount of time.”

Gary Miller, training and occupational development manager at SGS Tool Company, Munroe Falls, OH.

Certifications

Professional and technical certifications are respected industry-wide as objective confirmation and assurance of knowledge and/or skill achievement in various areas of technical expertise. Certification validates a level of expertise and provides employees with advancement opportunities that motivate them to continue learning new material.

Certification organizations such as the National Institute of Metalworking Skills (NIMS), Manufacturing Skills Standards Council (MSSC), SME and American Welding Society (AWS), require manufacturers to show that employees have not only been through the training but have applied and retained the knowledge and skills.

Educational Institutions & Competency-Based Programs

As educators work more closely with industry to develop job-driven training and fill the supply chain for skilled workers, it is telling that the U.S. Department of Labor's latest round of funding for the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grants Program stipulates that TAACCCT programs include competency-based assessments and training courses. With \$450 million in grant funds available, defining and mapping to competencies will help ensure that students are well prepared to enter the workforce.

Tracking Employee Training

An effective training program will include a validation process that not only tests a new skill but also continues to build on it. A sustained training program will provide employees with the opportunity to gain new skills, apply them on the job and then have their new skill sets validated through assessments, testing and certifications.

Accurate record-keeping and reporting is crucial for any successful training program. Companies can track employee training through their Human Resource Management Systems (HRMS), a Learning Management System (LMS) or work with a training partner that provides that service. These programs automatically track employee training and tie it back to the employer's business goals and they become a permanent part of an employee's record.

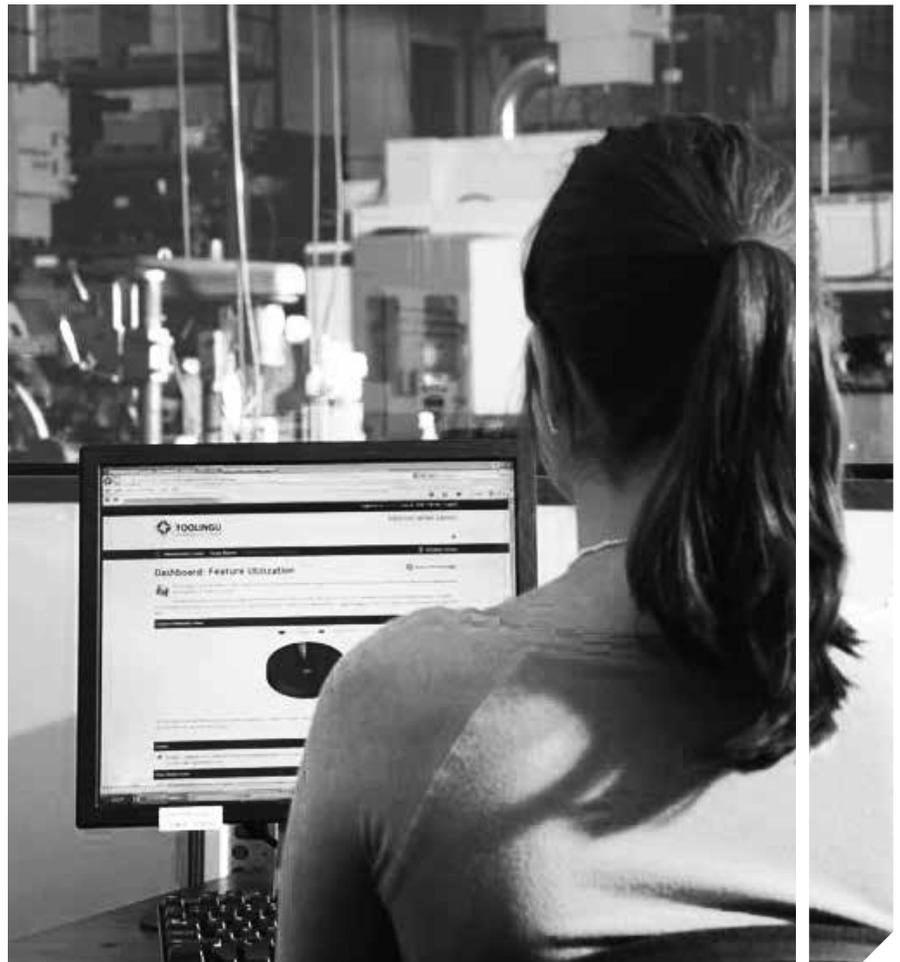


BENEFITS

Competency models allow companies to combat the increasing talent shortage and achieve stronger performance from their workforce while providing clear development pathways and career growth opportunities for their employees.

Advantages for companies:

- ▶ Ensures enterprise-wide consistency making a workforce more flexible and dynamic. This allows leadership to look at true cross-functionality across job roles within an organization to address current and future needs, ultimately reducing labor costs.
- ▶ Streamlines the training process and cuts costs by eliminating unnecessary/redundant training and allows more training on true needs.
- ▶ Helps managers to easily evaluate worker performance levels defined using specific behavioral indicators, which reduces subjective assessment and increases assessment accuracy. This also helps benchmark incumbent workers to ensure they are aligned with standards and what is expected of them.



Advantages for employees:

- ▶ Enhances employee satisfaction based on the rationality of the system.
- ▶ Defines and explains to an average performer what they need to attain in order to become a superior performer (career pathways). By eliminating guesswork, employees can clearly see what they need to do to improve their own skills.

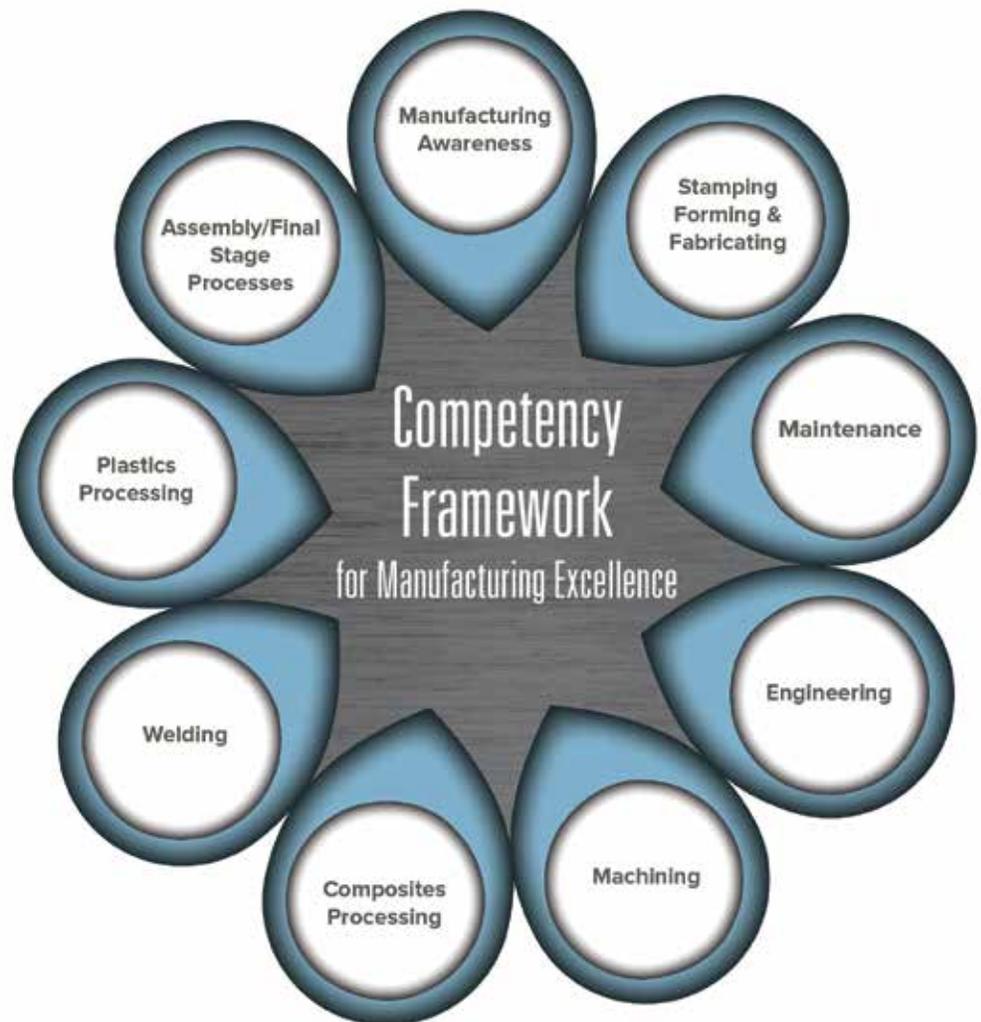
INDUSTRY Competency Models

There are two main competency models in the marketplace, which in some cases, complement each other.

Tooling U-SME Competency Framework for Manufacturing Excellence

The Tooling U-SME Competency Framework for Manufacturing Excellence, introduced in 2014, features a comprehensive series of competency models in nine manufacturing functional areas. Created by a cross-section of manufacturing experts, the tool is made up of more than 60 job role competency models, each outlining knowledge and skill objectives for job roles in production, technician, lead technician/technologist and engineer levels. Designed to complement other competency models in the marketplace, the Competency Framework can be used “as is” or customized to individual work practices at a facility. The knowledge objectives within the framework are mapped directly to Tooling U-SME’s extensive training resources and a specially designed LMS allows for seamless validation and record keeping.

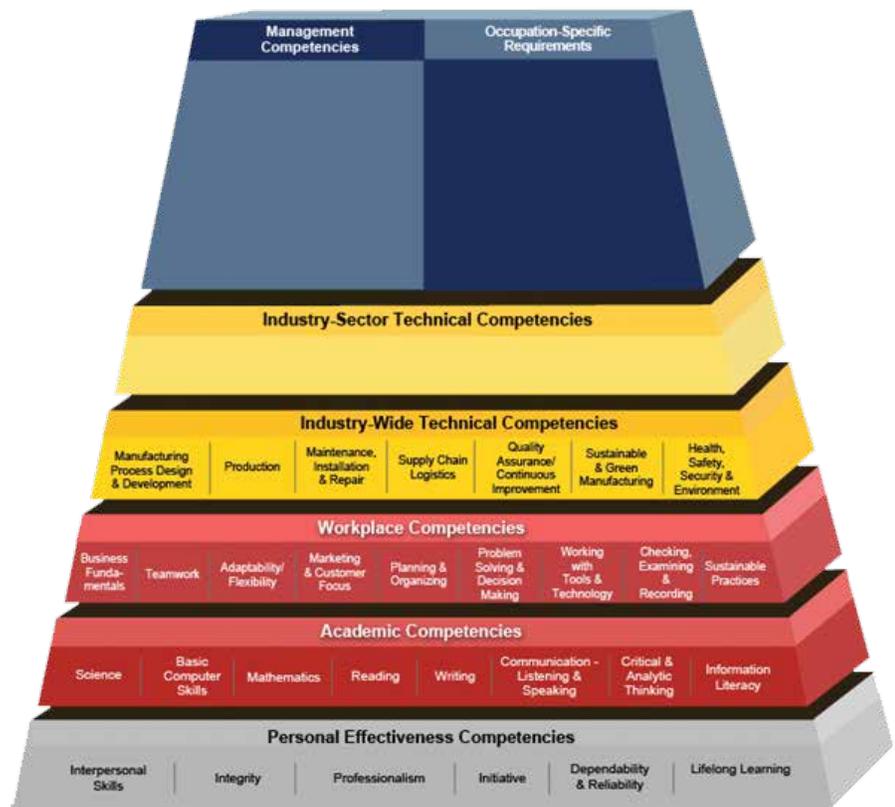
All this helps ensure employees have the knowledge, skills and abilities they need to be high performers.



INDUSTRY Competency Models

Department of Labor (DOL) Advanced Manufacturing Competency Model

Created by the Employment and Training Administration (ETA) and other industry organizations, the Advanced Manufacturing Competency Model is a broad platform outlining critical work functions and topical areas. It includes cross-cutting competencies applicable to various industry sectors such as pharmaceutical manufacturing or aerospace manufacturing. Tiers within its pyramid shape include Personal Effectiveness Competencies, Academic Competencies, Workplace Competencies, Industry-Wide Technical Competencies, Industry-Sector Technical Competencies, and Management and Occupation-Specific Requirements.



OTHER Resource

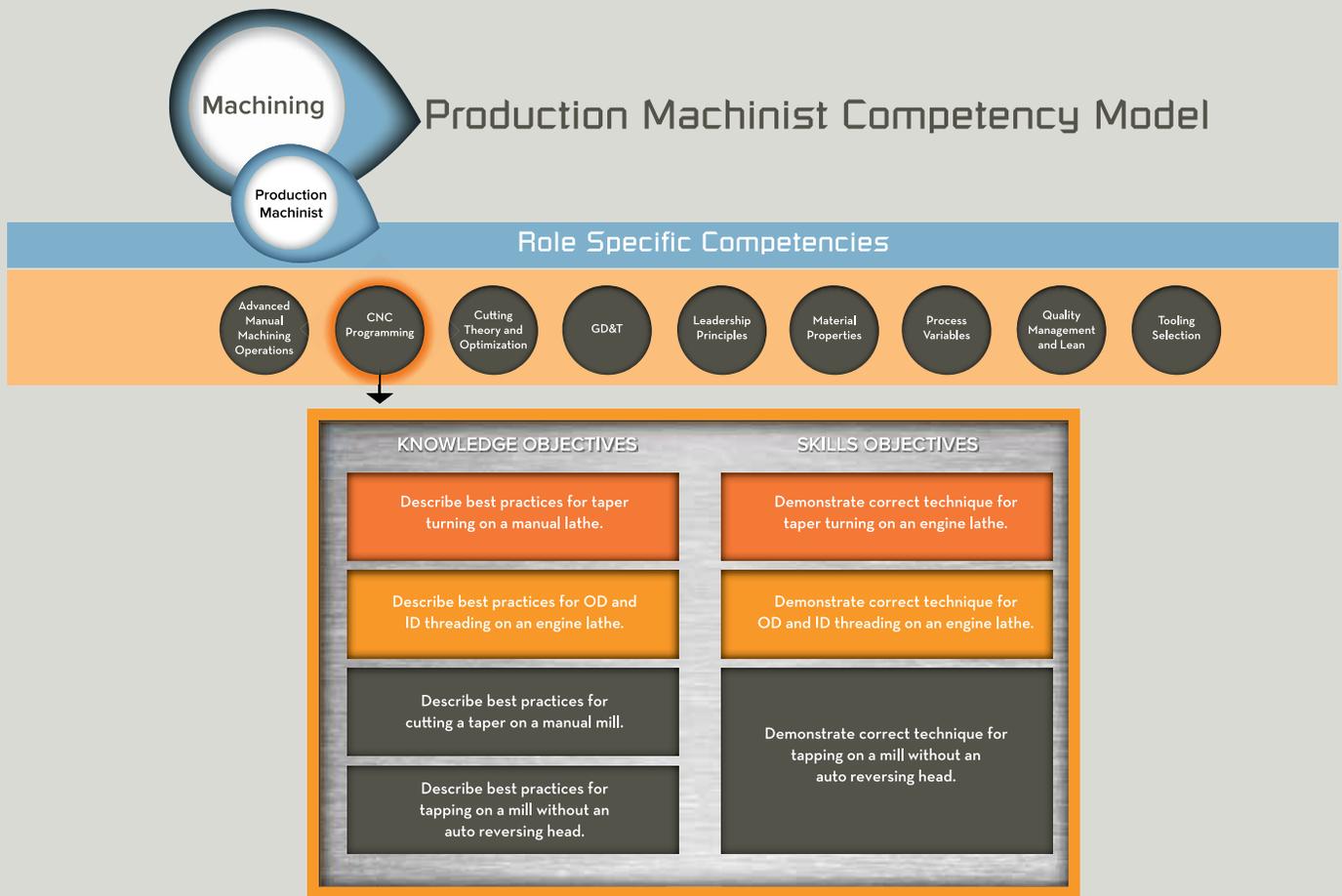
NAM-endorsed Skills Certification System

The NAM-endorsed Skills Certification System can support both these models.

It brings together certification models from a variety of organizations such as NIMS, MSSC, SME and AWS. These stackable industry-based credentials validate the skills and competencies needed to be productive and

successful in a manufacturing environment and can be awarded in post-secondary education. Currently there are 14 areas covered by the Skills Certification System including Machining and Metalworking, Engineering, Welding and Quality.

COMPETENCIES in Action

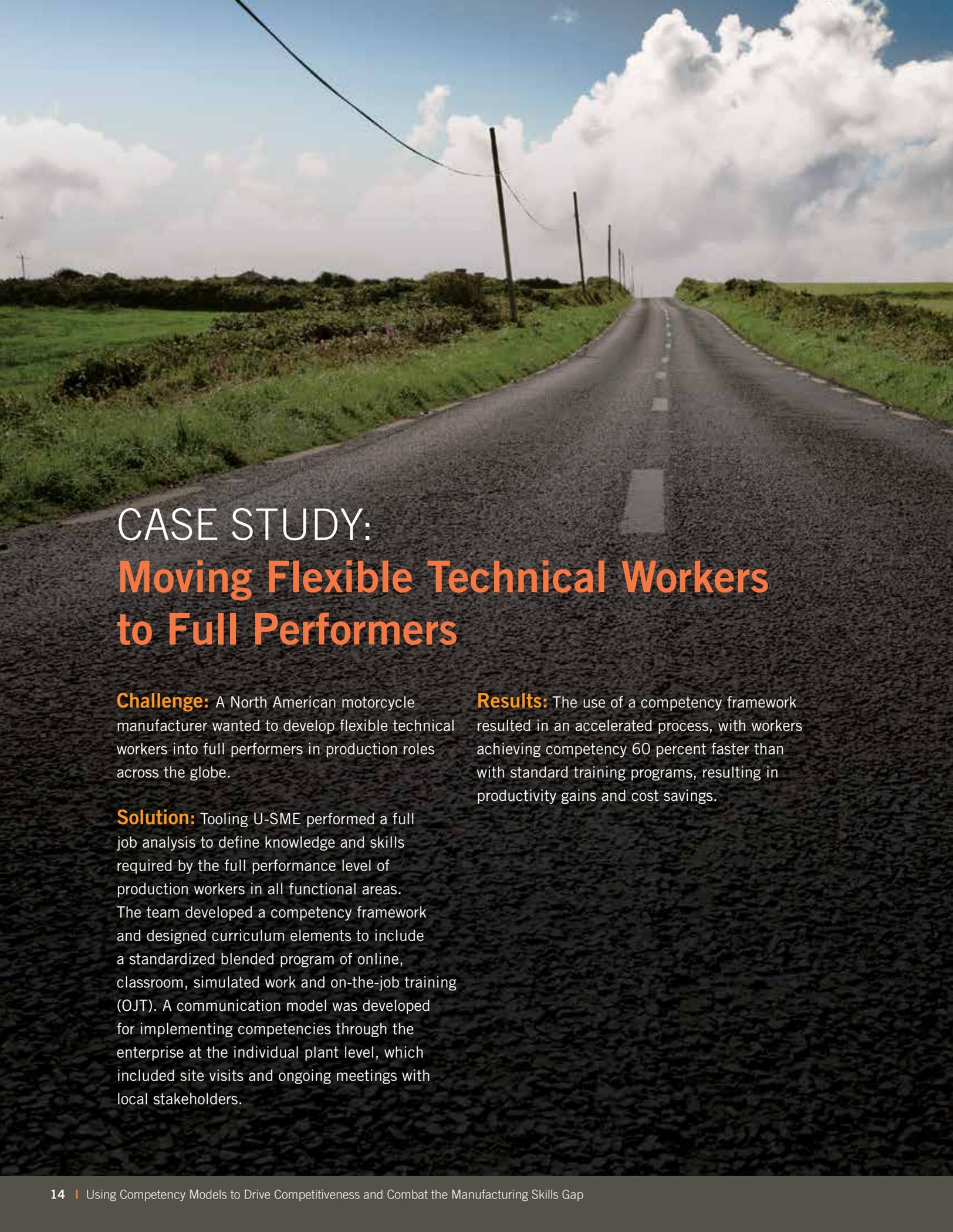


This Competency Model includes Fundamentals-Level Competencies in addition to Role Specific Competencies.

Production Machinist Competency Model

The Tooling U-SME Competency Framework outlines specific competencies for each job role in nine manufacturing functional areas. This example shows Machining as the functional area, then drills down to the Production Machinist job role, which has nine role-specific competencies such as Advanced Manual Machining Operations, CNC Programming

and Tooling Selection. Each competency offers both knowledge objectives and skills objectives as seen in the highlighted CNC Programming example. These knowledge and skills objectives are linked where appropriate to connect theory to hands-on practice. Each is mapped to specific training resources and mastery is documented.



CASE STUDY: **Moving Flexible Technical Workers to Full Performers**

Challenge: A North American motorcycle manufacturer wanted to develop flexible technical workers into full performers in production roles across the globe.

Solution: Tooling U-SME performed a full job analysis to define knowledge and skills required by the full performance level of production workers in all functional areas. The team developed a competency framework and designed curriculum elements to include a standardized blended program of online, classroom, simulated work and on-the-job training (OJT). A communication model was developed for implementing competencies through the enterprise at the individual plant level, which included site visits and ongoing meetings with local stakeholders.

Results: The use of a competency framework resulted in an accelerated process, with workers achieving competency 60 percent faster than with standard training programs, resulting in productivity gains and cost savings.

GETTING Started

The first step to building or improving a competency-based learning program is for human resources to work with production and operations managers to develop job descriptions that accurately define the qualifications needed by workers, and include both knowledge and skills. This helps create a sustainable program from hiring through advancement.

This front-end analysis provides the foundation for a program that meets a company's objectives related to budget, consistency, measurability and results, and a program that can be instituted across an organization regardless of size and number of locations.

Good training requires both knowledge and skills components that may not come from simple informal knowledge transfer or tribal learning. It requires understanding the concepts of what and why a job is done a certain way, and then requires on-the-job training to validate that the participant can fulfill on the needs for that role.

Informal learning is also an important component. Offering access to books, videos and information required to be competent in a company's job roles is key for overall program success. This complements tribal knowledge transfer that takes place as new employees come onboard and learn from experienced workers and their own observations about the company culture to determine how they can contribute on an individual basis.

The key is commitment from top management down to the individual

employee level. Supervisors are responsible for scheduling the training time for each employee. However, if the supervisor doesn't have the support of top management, they will resist building enough training into schedules to impact the process. A good communication plan is critical and should serve as a road map, guiding the organization's work toward specific outcomes.

It is also important to communicate to the shop floor staff that this focus is on knowledge and skill requirements of the job and align training designed to help each individual perform his or her job more efficiently, while providing new growth opportunities.

An effective training program will include a validation process that not only tests a new skill but also continues to build on it. A sustained training program will provide employees with the opportunity to gain new skills, apply them on the job and then have their new skill sets validated through assessments, testing and certifications.

Tying competencies to measurement system allows management to see the pay-off over time. This can be done through a company's HRMS or LMS, which automatically tracks employee training, supporting an employer's business goals. The team should look at ROI, Business Impact, Behavior Change/Job Application, Learning, Reaction and/or Satisfaction. This becomes a permanent part of an employee's record.

REFERENCES

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- 9 *Introducing a New Way To Achieve Manufacturing Excellence, Tooling U-SME Webinar, February 4, 2014.*
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COMPANIES RELY ON **Competency Models**

Not having access to a talented workforce is impacting production, quality, innovation and growth, which affects not just companies but the competitiveness of our entire country.

Some employers are using competency models to provide a structured way to look at job progression, job assessment and workforce planning and also to help identify competency gaps and put training in place to

address them. A well-designed competency framework, tied to business goals, becomes the foundation for performance management, talent acquisition and leadership development.

Having a system in place to codify knowledge and skills required for specific job roles with an aligned curriculum is critical for combatting the current and pending talent gap and building a high-performance team.

As pressure to find and develop skilled workers continues to increase, fueled by factors including retiring baby boomers and more manufacturing returning to U.S. shores, companies which start addressing this challenge today will retain a competitive advantage for years to come.

Contact

For more information on competency models and how they can help you meet your business goals, please call Tooling U-SME at (866) 706-8665 or email info@toolingu.com.

About Tooling U-SME

Tooling U-SME delivers versatile, competency-based learning and development solutions to the manufacturing community, working with more than half of all Fortune® 500 manufacturing companies, as well as educational institutions across the country. Tooling U-SME partners with customers to build high performers who help their companies drive quality, productivity, innovation and employee satisfaction. A division of SME, an organization that connects people to manufacturing solutions, Tooling U-SME can be found at www.toolingu.com or on Facebook (www.facebook.com/toolingu) and Twitter (www.twitter.com/toolingu).

