



Hiring Manufacturing Staff in the 21st Century: *A Fundamental Shift in Skills*



By
Charles A. Handler Ph. D.
& Mark C. Healy MA
Rocket-Hire, LLC

PEARSON



 **TalentLens**

Copyright © 2009 Pearson Education, Inc. or its affiliate(s). All rights reserved. 3141-09



Hiring Manufacturing Staff in the 21st Century: A Fundamental Shift in Skills

Introduction

Manufacturing is alive and well in the U.S.A. and in most parts of the industrialized world. A growing global economy and diversified demand in the European, Latin American, Indian, and Chinese economies have created broader and more distinct markets for goods and services where few or no opportunities previously existed. Furthermore, advances in technology have led to previously unthinkable levels of speed and efficiency in the manufacturing process. In fact, it can be argued that the goal of manufacturing in the 21st Century is to meet customer demand as rapidly and efficiently as possible. The biggest challenge in the modern manufacturing facility is to optimize supply in order to meet ever-changing demands. This would not be possible without technology that allows flexibility in supplier, manufacturing and distribution networks. Effectively meeting the challenges of modern manufacturing has become much more than a bricks and mortar issue because success now requires personnel who have what it takes to blend their mastery of technology with rapid but sound decision making.

Contrary to many opinions about industrial production in the US and Canada, this sector is strong and includes many long-standing industries ranging from automotive manufacturing to logistics. In fact, according to the National Organization of Manufacturers (NAM.org), the U.S. is still the leading manufacturing nation in the world.¹ Technology has given the manufacturing sector a new set of tools that have created fundamental shifts in almost every aspect of the manufacturing process. While technology has facilitated emerging scientific and high-tech sectors such as biotechnology and robotics, it has also served to change how things are done in virtually every manufacturing setting. With such an evolution in full swing, the requirements for success have started to change. While progress has introduced change on a variety of fronts, the sum total is that manufacturing as an industry may begin to re-evaluate the core element of success; the people doing the work and the skills required of them.

The process by which a product makes its way from raw material to a finished offering involves a complex assortment of staff to take a design on an engineer's computer and turn it into a ready-to-sell product line. While the focus was once on the operation of machinery, the modern manufacturing environment is one that relies on more complex technologies such as computers, logistics, and advanced robotics. The upshot of this is that the actual mechanisms required to create these outputs have changed significantly over the past 200 years, providing us with a lesson in the continuous changes spurred on by advances in technology. The manufacturing sector in North America has experienced the complex and sometimes

*While progress has introduced change on a variety of fronts,
the sum total is that manufacturing as an industry
may begin to re-evaluate the core element of success;
the people doing the work.*

painful ramifications of this progression over the last 40 years. One such ramification is the fact that each critical stage of this unpredictable evolution has required changes in the skills required to get the job done. While sheer brawn and loyalty were once the primary predictors of success, new roles critical to today's modern manufacturing facility (i.e., design, engineering, logistics, supply chain automation, etc) demand that successful employees bring much more to the table.

Changing technologies have had a huge impact on the processes used to effectively staff production facilities and this trend continues to be accentuated as we move rapidly into the 21st Century. For instance, while technology has created many new processes and efficiencies; skilled workers are in demand in large numbers, and entry-level or less-skilled job seekers are finding fewer opportunities in such areas as assembly, logistics, maintenance, and production support. Let's take a closer look at the substance behind these changes.

Changes In Manufacturing:

If it were even possible to sum up change to the real world of today's manufacturing in one sentence, it would be: "Fewer employees on more teams, using more technology to make crucial decisions more quickly." Most production operations no longer require legions of trainable or less-skilled employees who simply push buttons and follow an only occasionally varying routine. Rather, the Bureau of Labor Statistics (2007) report that the majority of production and assembly jobs are now classified as "Team Assembly" and that growth will be in primarily skilled occupations that are both part of and/or in support of from these newly designed positions. ²

What does the "Team Assembly" environment look like? Figure 1 shows how the typical production operation gets products built and packaged today, compared to the last century:

20th Century	21st Century
Fixed Production Roles	Job Rotation & Sharing
Permanent Full-time Staff	Combination of Full- and Part-time, Permanent and Temporary Staff
Low Autonomy to Make Decisions	Independent Decision Making
Emphasis on Technical Skills	Technical and Interpersonal Skills of Equal Importance
Unchanging Procedures and General Safety Guidelines	Detailed, Dynamic Procedures and Evolving Guidelines
Operation of Low Tech Machines	Computer and IT Skills Critical

Figure 1: Changes in the nature of manufacturing tasks

So manufacturing organizations – and their individual production facilities – are unique from a staffing point-of-view because the modern factory is no longer a just giant building filled with hundreds of interchangeable low-skill, low-wage full-time employees. Understanding the bigger picture requires that we first understand the specific nature of these changes.

The following summarizes some of the BLS' 2007 predictions for the larger categories of production-oriented job opportunities through 2014:³

- Sorters, Samplers, & Weighers:** Decline
- Assemblers and Fabricators:** Growth
- Machine Operators – Plastic:** Growth
- Machinists:** Growth
- Painting and Coating Workers:** Growth

So, while the way the work is done may have changed, this does not necessarily indicate a repeat of the hiring slumps or reductions in force seen over the last part of the 20th century. Moreover, recent surveys by the NAM support a shortage of applicants for these roles, together with a 37% increase in demand for positions categorized as “high skill.” And in a survey of 37,000 organizations in 27 countries and territories, Manpower's 2007 Talent Shortage survey reveals the top 10 “jobs that employers are having difficulty filling:”⁴

- | | |
|---------------------------------|----------------------------------|
| 1. Sales Representatives | 6. Laborers |
| 2. Skilled Manual Trades | 7. Production Operators |
| 3. Technicians | 8. Drivers |
| 4. Engineers | 9. Management/Executives |
| 5. Accounting and Finance Staff | 10. Machinists/Machine Operators |

Together with the previously discussed shift in how work gets done in modern production facilities, these trends don't just indicate shifts in staffing needs, but the implications of a dramatic re-focus on the fundamental nature of how of these critical positions are filled and the skills required to fill them effectively.

Skilled trades, maintenance, and supervisory roles within factory walls (and for firms that help manufacturers staff these jobs) now require a more diverse set of skills beyond mechanical, mathematical and technical

...each critical stage of this unpredictable evolution has required changes in the skills required to get the job done.

knowledge; and it's up to the 21st Century manufacturer to find employees who bring these diverse qualities to the plant. To be sure, many growing manufacturing organizations report a greater need for workers with teamwork, decision making, technology, communication, and customer service skills. The team assembly roles described earlier involve a core production team focusing on a large piece of the production puzzle or even an entire product. Furthermore employees of all types must be able to think fast on their feet and use technology to help them ensure to uphold the utmost levels of speed and efficiency in all aspects of their jobs. With more interaction, coaching, learning, and initiative required, even entry-level roles require a well defined set of personality traits and core individual talents to keep production on schedule.

But looking for these skills in job applicants doesn't just benefit the shop floor, the shipping department, the engineering department, etc; it also increases the number of internal management candidates available to a growing company. Organizations that focus on people skills end up with the fringe benefit of developing a pool of supervisory candidates and greater leadership bench strength.

Focus on Key Competencies In Manufacturing:

Understanding the implications of these changes discussed in the previous sections and their subsequent impact must begin with a detailed examination of the specific applicant characteristics required for success on the job.

Which key traits are most important to the immediate present as well as the future of manufacturing?

Figure 2 displays some of the more dramatic differences in necessary qualities of both skilled and entry-level, untrained production staff.

Figure 2: Changes in the required skills and traits for manufacturing personnel

Old World	New World
Learning one or two specific technical roles	Mechanical Reasoning, Logic, Troubleshooting & Spatial Visualization
Physical Strength & Flexibility	Personal Flexibility, Communication & Cooperation
Ability to follow fixed, unchanging procedures	Initiative, Persistence, & Independence
General attention to production & safety procedures	Attention to detail, Self-Control, & Dependability
Following orders	Making independent decisions
Operating, Maintaining, Designing Mechanical Machinery	Operating computers or computerized machinery and using computers for a wide range of critical functions

Fortunately, there are ways to find these skills and qualities in that pile of resumes on the hiring manager's desk, but the pathway to taking what we know about today's manufacturing environment and turning it into recruitment and hiring success requires taking a fresh look at some of the major issues facing those in charge of the staffing process. For instance, without a sophisticated approach to hiring the following can short-circuit even the most well-intentioned attempts to fill critical positions:

- **High applicant volume**

In many cases, organizations just don't have the time and resources needed to evaluate each and every resume to the level required to fully understand an individual's potential contribution. Focusing in on the right skills allows for more effective management of applicant flow, and easier time screening because skill-related needs are agreed upon by management.

- **Shortcomings of the resume**

The resume is an omnipresent and seemingly essential part of the hiring process. Not insignificantly, reviewing and taking action on resumes (whether downloaded from a job site or directly acquired via email or snail mail) is often rated by managers as one of their most stressful and annoying tasks. Taking up valuable time with a dissatisfying and mentally-challenging task can be frustrating because it keeps hiring managers away from other critical job duties.

- **Time crunch**


The longer this work remains unattended to, the further away the company is from meeting its strategic goals and objectives. This often creates tension between taking the time to thoroughly evaluate applicants and simply filling the position with the first decent candidate.

- **Narrow focus**

It is often the case that applicants for production roles are judged based on general technical experience. But there are often other factors that, if not evaluated, will play a major role in both long and short-term employee performance. To be sure, a high failure rate of new hires in a high-volume role is more often the result of poor fit with the organization or certain inadequacies in skills, not a lack of technical ability.

- **Lack of standardization**

Effective hiring requires a standard process that is followed by all persons making hiring decisions. The more deviation occurs between hiring professionals, the less sure one can be about the ability of those hired to share the common traits required for success.



By “closing the loop” and evaluating the impact of selection decisions, organizations can keep close tabs on the ROI associated with their staffing processes.

The issues listed on the previous page, in combination with the fundamental shift in the skill sets necessary for success require a modern, yet proven approach to hiring. Fortunately, the combination of new technology and 100 years of scientific evidence supporting what is known as the “predictive model” can be leveraged to create timely, relevant recruitment and staffing programs for today’s savvy manufacturing and production organizations.

What about outsourcing? Even if you outsource much of your production, you still need to be conscious of assessment of key competencies. Outsourcing firms in offshore locations – as well as firms within traditional manufacturing regions of North America and Europe - vary in their ability and motivation to truly assess applicants for jobs to work on your products. Therefore, it is even more critical for organizations that farm out some or all of their key work to pay attention to how employees are positioned, and to insist on assessment and evaluation of critical skills and traits.

Leveraging The Predictive Model In Manufacturing

While the skill set required for success in manufacturing jobs is undergoing some fundamental shifts, the good news is that Organizational Psychologists have decades of experience in understanding how to measure the key traits, skills, and abilities that are critical for staffing modern manufacturing facilities. The cornerstone of this experience lies in the use of a methodology that provides the ability to systematically evaluate applicants in order to assess key attributes that are predictive of job success. This process is referred to as the “predictive model” because it provides hiring personnel with the data needed to make predictions about which applicants have what it takes to get the job done.

Leveraging the predictive model requires adherence to a three-step methodology. At the core of this methodology lies the use of tests and assessments that accurately and reliably measure skills and traits known to be critical for success. The importance of creating a hiring process that leverages the predictive model cannot be overstated and as such, it is essential that organizations align hiring practices with the following steps:

Step 1: Identify critical characteristics for success

This step involves a process often referred to as job analysis and/or competency modeling. The goal of this step is to break a job down into the various human elements that are critical for success. Without first understanding what it takes to perform a job, accurately predicting applicant performance is impossible. This step usually includes an examination of job documentation, and/or surveys and interviews with incumbents and managers. Often, a job description or competency model is developed as a result of these activities. It is critical to get this right, as documented job duties, along with linked KSAO’s and competencies, becomes the basis for the predictive content included in the selection process.

Step 2: Choose appropriate measures

After establishing the standards and success factors for the job, one selects the predictive materials required to systematically measure key traits. Predictive content usually include things such as tests, inventories, interview questions, and other evaluative measures.

The important thing to understand regarding this step is that the more closely the predictive measures used in hiring map onto critical aspects of job success, the more accurate selection decisions will be. The ramifications of this fact for hiring modern manufacturing workers are clear. Failing to use assessments designed to account for the fundamental shifts in skills that are occurring can lead to skills gaps in one's labor force. These gaps can have a variety of negative ramifications on productivity and workforce planning.

Step 3: Evaluate accuracy and collect feedback

Once a selection system has been deployed, it is critical that its ability to predict job success be evaluated. The manufacturing environment is particularly amenable to this type of evaluation as it has strong philosophical ties with the core ideas of the Six Sigma methodology. By “closing the loop” and evaluating the impact of selection decisions, organizations can keep close tabs on the ROI associated with their staffing processes. Without this understanding, identifying the presence of skills gaps, and the success of efforts designed to close them are impossible. This is akin to leaving money on the table because increased predictive accuracy translates directly into both short and long term savings.

There are a variety of ways to evaluate the accuracy of selection measures. The common thread lies in the statistical evaluation of hiring decision accuracy. Organizational Psychologists have been assisting companies with this type of study for decades and the results have clearly reinforced the ROI that can be obtained by using an assessment that measures the right assessment for a particular situation. After an assessment process has been in place long enough to hire employees and judge their subsequent job performance, scores or ratings on the assessment tool or system may be statistically compared to job performance measures, such as supervisor performance evaluations, financial outcomes, and other indicators. Subsequently, modifications to the system may be completed, with hiring accuracy and usability enhanced.

By making use of the core of the predictive model and correctly aligned assessment content, organizations can augment hiring in a manner that will deliver better employees, legal defensibility and long-term value. Short-term value is delivered via the ability to measure the impact of hiring decisions on things such as absenteeism, turnover, productivity, and safety-related behaviors. Long term value comes via the ability to collect data that will help organizations to build bench strength by identifying key skills required for eventual movement into higher level positions. The ability to look forward when making hiring decisions adds an extra dimension to the utility of the predictive model.

...the more closely the predictive measures used in hiring map onto critical aspects of job success the more accurate selection decisions will be.



Conclusion

In summary, while all industries can benefit from the predictive model, its relevance for successfully operating a modern manufacturing facility is clear. Without accounting for the skills needed for today and beyond, measuring these skills, and evaluating the effectiveness of the measurement process, organizations are selling themselves short in the most critical of areas: Human capital.

Unfortunately, much of the manufacturing sector is still not making use of the predictive model and the assessments that make up its core value proposition. In recent survey (2006) by Rocket-Hire only 12% of respondents from the manufacturing sector indicated that they used pre-employment assessments. This figure is even more alarming when one considers that respondents from other sectors (customer service -42%, IT- 38%,) indicated much higher usage levels. Clearly there is a tremendous amount of potential for the manufacturing sector to increase critical business outcomes via the use of predictive assessments.

How does predictive assessment lead to a more profitable future for the savvy manufacturing organization? Fewer people on the factory floor and in day-to-day management roles mean more responsibility on each individual's shoulders. And that means companies must collect more detailed information about applicants before making what may be a million dollar decision on filling a key role. But the results far outweigh the effort. A keen focus on a match between employee skill sets and the goals of the organization will drive the following:

What should a manufacturer expect from the predictive model?

Lower Absenteeism and Turnover – Workers who get along with others and possess the right skills for the job tend to show up on time - and stick around when you need them.

Improved Individual Performance – With a focus on the right skills and traits for success, each new employee reflects this focus, with improved results.

Better Team Performance – A group that plays well together gets more done. When hiring managers focus on teamwork and collaboration skills, the result is more employees who know how to get along – and reach their goals.

Stronger Legal Compliance – Standardizing your hiring means greater compliance with an ever-evolving legal and regulatory environment.

Community Reputation – Companies that seek out better people get better when it comes to their people. And the community finds out; becoming an “Employer of Choice” has little to do with flashy recruiting campaigns and presence on job boards, and all to do with word-of-mouth stories, opinions, and strong employee hiring referrals.

Bench Strength – Continued growth and success equal greater demand for managers to continue these achievements. Bringing in the right kind of skilled worker means a future with more internal candidates for key leadership roles.

Fortunately, a savvy production facility or manufacturing organization can immediately implement the

predictive model using the latest internet technology to lower staffing costs while increasing new hire quality. Today, the best manufacturers in the world - great companies like Toyota, Whirlpool, and John Deere – use the predictive model via comprehensive pre-employment assessment systems that key in on required traits like those described earlier. Whereas there are no legitimate claims to 100% hiring success, the process of using improved tools to lead to greater predictive accuracy increases the chance that each hire one makes is a good fit – a value-add for the manufacturing organization. This in term leads to a tremendous impact on the bottom line. In fact it is not a stretch to suggest that an organization hiring only one or two hundred employees a year can achieve ROI in the millions simply by including properly implemented assessment tools as a key part of the hiring process.

With so much evidence that comprehensive hiring systems are superior to traditional, hit-and-miss hiring methods, the primary question for any manufacturer is whether they want to be a typical firm...or a company that understands and leverages best practices to ensure success both today and tomorrow.

ABOUT THE AUTHORS:

Dr. Charles Handler (chandler@rocket-hire.com), is the president and founder of Rocket-Hire.com. Throughout his career he has specialized in developing effective, legally defensible employee selection systems. He has taken what he learned developing recruiting and selection solutions for a wide variety of organizations and combined it with his love of technology to help clients develop new models for employee selection. His philosophy focuses on combining sound science with innovation and practicality to create online hiring strategies that provide ROI and demonstrate the value of human capital. Charles has a Master's and Ph.D. in Industrial Psychology as well as PHR certification from SHRM. Charles is a member of the American Psychological Association, the Society for Industrial/Organizational Psychology (SIOP) and SHRM. More information about Charles' ideas, experience, and consulting services can be found at rocket-hire.com.

Mark C. Healy is a consultant, teacher, and writer based in Oakland, California. Mark assists companies with the development of their human capital strategy and designs hiring, leadership development, and training programs. He has expertise in competency modeling, online assessment, behavioral interviewing, and 360-degree feedback, and has implemented employee assessment tools in hundreds of companies all over the world. Recent clients include Wachovia Bank, Genentech and Monster.com; he also works with organizations via affiliations with Right Management and Rocket-Hire. He formerly held positions with Barrett & Associates, DDI, and 3D Group. Mark teaches Statistics, Research Methods, and Industrial/Organizational Psychology at De Anza College in Cupertino, California and has an MA in Industrial/Organizational Psychology.



REFERENCES

1. National Organization of Manufacturers (2005). 2005 Skills Gap Report: A Survey of the American Manufacturing Workforce.

2. Bureau of Labor Statistics (2007). Occupational Outlook: Assemblers. Washington, DC: US Department of Labor.

3. Bureau of Labor Statistics (2006). Occupational Outlook Handbook – 2006-2007 Edition. Washington, DC: US Department of Labor.

4. Talent Shortage Survey Global Results. Manpower 2007.

Pearson

Pearson's Talent Assessment business develops and delivers the TalentLens line of scientific assessments for employee selection, development, retention and succession planning. With more than 85 years of experience in the employee assessment field and offices in eight countries, Pearson offers exceptionally reliable and well-researched products such as the Watson-Glaser Critical Thinking Appraisal, Raven's Progressive Matrices, and the Golden Personality Type Profiler. Its clients include half of the Fortune 500, expanding small businesses, and all organizations that make identifying talent and unlocking employee potential a top priority.

Learn more and create your online testing account at www.TalentLens.com



888-298-6227 • TalentLens.com

