# *Competency Models In Action:*

## Automation Competency Model Used by Workforce Developers, Educators, and Industry

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### Introduction

Automation professionals are engineers, technologists, technicians, and others who create and apply technologies such as robotics, electro-optics, wireless applications, and systems integration to control manufacturing and production processes. Their work supports many industries, including process and component manufacturing and packaging, transportation, utilities, oil and gas, mining, defense, and facility operations. Because of the high-tech, rapidly evolving nature of the field, automation workers need years of experience and knowledge spanning several engineering disciplines to do their jobs effectively. As a result, the profession faces a major challenge in preparing enough qualified workers to meet current and future employer demand. The Automation Federation (AF) is a not-for-profit, umbrella organization that works to promote the automation profession and develop the education and training programs that will prepare the workers of the future.

### The Workforce Challenge

The total number of automation workers needed by employers is increasing. At the same time, the automation workforce is bracing for the retirement of baby boomers—skilled and experienced workers who cannot easily be replaced. Today's middle, high school, and college students represent the future pipeline of new workers. Unfortunately, there is a general lack of public awareness of the field and the career opportunities it provides.

U.S. colleges do not teach automation as an undergraduate engineering discipline. Automation engineers generally graduate with majors in electrical or chemical engineering and require several years of work experience to perform at a professional level. Employers are reporting that the students who do enter the field often are not work ready, lacking adequate foundational and basic workplace skills. The profession lacked a standard way of defining the knowledge and skills that employers want in an automation worker.

### Solution: Development of the Automation Competency Model

The Automation Federation is working to combat these challenges by promoting the automation profession and infusing the knowledge of automation prerequisites into education and training programs and employer recruitment and hiring practices.

AF needed a resource to define the field and its skill requirements that would serve as a foundation for these workforce development activities. Aware of the Employment and Training Administration's (ETA) Industry Competency Model Initiative, AF reached out to ETA to collaborate on a competency model for automation.

During 2008-2009, AF, ETA, and other stakeholders worked to develop the Automation Competency Model (ACM). Using the Advanced Manufacturing Competency Model as a starting point, AF convened several meetings of subject matter experts to develop and validate the draft. It was then circulated and revised until it accurately depicted the competencies necessary for a worker to be successful in the automation industry. When the ACM was completed, it effectively became the foundation for AF's workforce development plans.

## Promoting the Field

In support of its efforts to increase public awareness of automation and the opportunities for good jobs in the field, AF is using the ACM to reach out and create partnerships with organizations representing business, education, and government, including the American Association of Community Colleges, Durham public schools system, Manufacturing Extension Partnership, North Carolina State University, U.S. Chamber of Commerce, FIRST (For Inspiration and Recognition of Science and Technology), and U.S. Department of Veterans Affairs.

AF believes that students should be introduced to the possibilities of careers in automation as early as possible. This way, students can follow education tracks that emphasize science, technology, engineering, and math courses. AF is sharing the ACM with middle and high school students and teachers to introduce them to automation. By laying out the skills a student or job seeker will need to get involved in the field and find a job, the ACM functions as a pathway into the profession.

## Developing Education Programs

The ACM is also a resource for developing the education and training programs that will prepare these students for careers in automation. The model is a roadmap for developing articulation agreements that will allow students to take post-secondary automation courses while still in high school. In addition, AF is planning to build an automation academy; a high school specialized for students pursuing automation careers.

The model is a valuable resource for developing programs at the post-secondary level as well. Cleveland Community College in Shelby, North Carolina has been working with AF to develop an associate's degree program for automation technology. When Cleveland CC faculty members Mark Gengler and Mitchell Sepaugh reviewed the ACM, they realized Cleveland CC's existing Electronics Engineering Technology and Industrial Systems Technology programs had similar capacities. This meant they were well positioned to create an automation technology program. Mr. Gengler and Mr. Sepaugh approached AF about developing an Automation Center of Excellence where students could receive automation training leading to an ISA and Automation Federation approved Associate of Science degree and a certified automation technician designation. They are now working through the process of applying for state approval of the automation curriculum, which will include course objectives and outcomes based on the ACM.

Mr. Gengler and Mr. Sepaugh believe the model will be useful for communicating with students. The model will show students the importance of learning science, technology, engineering, and mathematics and help stimulate interest in automation and manufacturing-related careers. Mr. Gengler and Mr. Sepaugh report that the model is valuable because it gives the industry a tool to describe the skills needed and can be used to support the development of an automation program.

## Creating Pathways for Veterans

In many military occupations, especially those involving a technical course of study, service members gain skills that are potentially transferable to jobs in automation. These skills, along with training and qualifications received during the length of service, are recorded in personnel records. Individuals with these skills would have a head start in entering the automation profession upon leaving military service; many, however, are not aware of this opportunity for a successful transition to civilian employment. They may not know that their skills apply to automation and what it is like to work in an industrial environment.

Steve Huffman, Chairman of the Government Relations Committee at AF and Vice President of Strategic Accounts at Mead O'Brien, Inc., is using the ACM to create a template for analyzing how the skills gained in certain military occupations apply to success in automation jobs. The template aligns skills learned in the military with automation skills so veterans can see how effectively they could transfer their skills to automation occupations. In addition, the ACM serves as a tool to inform these service members, many who have not worked in an industrial environment, what additional skills they might need to be employable.

## Supporting Automation Businesses

Automation companies are using the ACM for internal human resources and employee development activities. Steven Pflantz, engineer at CRB Consulting Engineers, Inc., participated in the development and validation of the ACM, and has used the completed model as a foundation for creating competency models for five automation occupations. CRB is using the occupation models to develop self-assessment checklists. These checklists contain lists of occupational competencies aligned with training codes, and spaces for employees to rate themselves on each competency. After employees self-assess, they work with their supervisors to direct their training and career development toward addressing their skill gaps.

CRB is using the ACM as a resource for performance reviews, evaluating new hires, and conducting gap analysis for training. In addition, they are using the model as a resource for recruiting at the college level by sharing the model at job fairs and recruiting events. The model helps prospective automation engineers see what skills they need to enter the field and serves as a resource for career planning.

The ACM is serving as a resource for students, employers, workforce professionals, industry associations, and educators. By helping to define the field and its workforce needs, the model provides a common language for discussion between these groups. It is used to support the development of education programs and create pathways into the field.

For more information about the ACM and industry competency models, visit the Related Links below.

**Related Links**

Automation Competency Model
http://www.careeronestop.org/competencymodel/pyramid.aspx?AT=Y

Automation Federation
http://www.automationfederation.org/

Competency Model Clearinghouse
http://www.careeronestop.org/competencymodel/default.aspx

Competency Models in Action: Community College Partnership Develops Occupational Competency Model Based on Automation Industry Model
http://www.careeronestop.org/competencymodel/info_documents/AnalyzerTechnicianCMInAction.pdf