KY FAME
Building Kentucky’s 21st Century Skilled Manufacturing Workforce Through a Unique Employer-Educator Partnership

MODEL SUMMARY
The Kentucky Federation for Advanced Manufacturing Education (KY FAME) develops a pipeline of skilled advanced manufacturing technicians through on-the-job application of a three-pronged process combining technical skills, personal behaviors and manufacturing core exercises. The program serves to improve the image of the manufacturing industry and promote manufacturing-related career pathway opportunities for Kentucky residents.

BACKGROUND
In the late 2000s, Toyota’s Georgetown, KY, plant established a unique apprenticeship-style program to train and replace its aging skilled workforce, which was ripe for retirement. Toyota established the program because few applicants had the technical and professional skills necessary to perform the highly technical and advanced manufacturing jobs at its Georgetown plant. The program was designed around Toyota’s manufacturing principles and included 11 fundamental elements: six personal behaviors coupled with five manufacturing core exercises. KY FAME was developed in response to growing workforce needs across a variety of manufacturers from multiple sectors as a proactive effort to create a curriculum aligned to the workplace that could be applied simultaneously on the job and in the classroom.

The first cohort of KY FAME students started in 2010, with 12 students who were simultaneously working at Toyota and pursuing associate degrees at Bluegrass Community & Technical College. The program has grown as employers have witnessed the success at Toyota and the potential benefits to their companies and regions. As of fall 2015, the Advanced Manufacturing Technician (AMT) track has 104 students enrolled at six Kentucky community colleges, with the seventh and eighth regions recently organized.

In recent years, another region of the state — northern Kentucky — has experienced a similar high demand for manufacturing jobs. The northern Kentucky story is illustrative of how KY FAME is being adapted and adopted across the commonwealth. In northern Kentucky in particular, multiskilled maintenance professionals were in high demand, and due to the labor shortage, workers were moving from company to company as they were offered more pay. In late 2013, the Florence, KY-based team of Robert Bosch Automotive Steering LLC (Bosch AS), led by Mike Hirsch, set out to study and benchmark best practices of work-and-learn programs to train and secure a dedicated pipeline of skilled workers after high school graduation. The team studied and toured apprenticeship and workforce development programs in the Carolinas, Michigan and Kentucky before settling on the KY FAME AMT program as its model of choice.

The Bosch AS team worked with local manufacturing companies to develop a Northern KY FAME Chapter, whose objective is to satisfy manufacturing companies’ needs for skilled maintenance technicians and individuals
who can operate, program and maintain next-generation digital automation technology. In August 2015, the chapter launched its first semester of the program in partnership with 12 sponsoring companies. The first class of 25 students is expected to graduate in May 2017. The chapter now has 17 member companies and expects the number of students enrolled in the program to grow to 60 per cohort year.

### Partnership

KY FAME is a collection of manufacturing-led regional chapters including almost 100 companies across Kentucky, such as 3M Manufacturing, Bosch AS, General Electric, Hahn Automation, L’Oréal, MUBEA and Toyota. Local economic development and workforce organizations such as the Northern Kentucky Tri-County Economic Development Corporation and the Central Kentucky Business Education Network partner within the regional chapters. The KY FAME governing board of directors includes the KY FAME regional chapter presidents, the Kentucky Community and Technical College System representing education, the Kentucky Association of Manufacturers representing manufacturers, and the Kentucky Cabinet for Economic Development representing government.

### Nuts and Bolts

Companies recruit three different types of students for the KY FAME program:
- High-achieving high school students with an interest and background in science, technology, engineering and math (STEM);
- Veterans with technical backgrounds; and
- Current or displaced workers interested in advancing their skills.

Once identified, prospective students complete and submit an application, which is then reviewed by KY FAME and company partners. Recently, Bosch AS posted five internal openings for the program and received 55 applications. These applicants completed the required entrance exam (COMPASS or ACT) as well as an on-site interview.

Each week, over the course of five consecutive semesters, selected program participants complete a 40-hour work week, plus course homework. The work week includes:
- 16 hours of instruction and labs over two days on campus in a simulated manufacturing setting at a Kentucky Community and Technical College System location; and
- 24 hours of hands-on apprenticeship-style training with mentors at an AMT partner company. Through hands-on instruction at these companies, students make the connection between concepts presented in the classroom and the workplace.

Key elements of the program include:
- **Advanced Technical Skills Training:** Through classroom learning and hands-on work experience, students learn the technical skills needed to succeed in manufacturing. These skills include electricity, robotics programming and operation, fluid power, mechanics, and industrial troubleshooting.
- **Analytical, Critical-Thinking and Interpersonal Skills:** Students learn to work in team environments, solve real-world business problems using lean processes, identify ways to improve processes and cut costs, and adapt to business changes. These skills are critical for students to operate and maintain the complex and expensive machines used in U.S. manufacturing operations.
- **Exposure to Multiple Manufacturing Businesses and Processes:** Students are exposed to all companies within their KY FAME chapter membership, not just the company where they are employed.
- **Core Skills for a Safe and Productive Work Environment:** The program is based on five core manufacturing fundamental elements. Students learn the skills necessary for a safe and productive work environment. These skills are taught through manufacturing core exercises, which include safety culture, the “5S system” of efficient workplace organization, lean manufacturing, problem-solving and machine reliability.
The KY FAME partnership program provides a locally sourced pipeline of globally competitive, talented and skilled industrial maintenance workers. KY FAME student benefits and outcomes include:

- **Common Employability Skills for Success in Business:** Students learn key skills through the classroom and workplace, including the interpersonal, analytical and critical-thinking skills necessary to succeed in business. The six personal behaviors are attendance, initiative, diligence, interpersonal skills, teamwork and communication. Assessments in school and at work chart the development of these skills.

- **Pathway to High-Demand Technical Jobs:** KY FAME graduates are prepared for employment as industrial maintenance technicians. According to a Q1 2015 Economic Modeling Specialist International report, a source for labor market data and regional economic analysis, the demand for skilled industrial maintenance technicians is projected to grow by 9 percent in Kentucky and 11 percent nationwide between 2014 and 2024.

- **Associate Degree in Applied Science in Industrial Maintenance Technology — Advanced Manufacturing Technician Track:** KY FAME graduates obtain an associate degree with 68 to 71 college credit hours that may be applied toward a bachelor’s degree in advanced manufacturing engineering or advanced manufacturing business at partner four-year universities. At many companies, program graduates hired full time may apply the company tuition reimbursement toward advanced degrees.

- **Industry-Recognized Certifications:** KY FAME employers led the development of the AMT track, recognizing the need for statewide quality and consistency in technical skills education.

- **1,800 Hours of On-the-Job Training:** Students complete two years of hands-on work experience at their sponsoring employer.

- **Little to No School Debt:** Company sponsors provide competitive pay, with most students earning enough (approximately $25,000) over the course of the program to cover the associated tuition and program costs.

- **Opportunity for Full-Time Employment with the KY FAME Sponsoring Employer:** Students develop relationships with and the skills needed by sponsoring employers, making them quality candidates for potential full-time employment.

KY FAME employer benefits and outcomes include:

- **A Pipeline of Skilled Workers:** At Bosch AS, costs to replace a technician average $10,000, while the cost per participant in the KY FAME program is only $2,500. This makes it extremely cost effective to develop a pipeline through KY FAME, a program aligned to Bosch AS’ specific needs for skilled technicians.

- **Mentoring and Training of Entry-Level Technicians to Company Standards:** KY FAME allows employers to train maintenance technicians to their company standards for quality, productivity and safety. To compete globally, the company is focused on improving productivity and reducing quality incidents while maintaining a safe work environment. The team at Bosch AS believes this is essential to staying globally competitive.

- **Skilled Future Leaders:** Upon program graduation, students are often hired into full-time jobs as team or line leaders within the sponsoring employer’s organization. The expectation is that, as the KY FAME program continues at Bosch AS, improvements will be reported within the key performance indicators for productivity, quality and safety.

KY FAME technical and community college benefits and outcomes include:

- **Faculty Equipped To Meet Local Manufacturing Needs for Skilled Workers:** As part of the program, faculty are trained and certified to deliver the KY FAME curriculum. The curriculum aligns with the most in-demand, technology-driven skills for technicians within the areas of robotics, mechanics, electronics, fabrication and fluid power.

"The next step is to identify high school students in their junior and senior years to complete internships at Bosch AS that would serve as a feeder into the KY FAME AMT program.”

— Mike Hirsch, Vice President of Operations, Robert Bosch Automotive Steering, and President, Northern Kentucky FAME Chapter
Direct Access to Local Employers: Employers and educators constantly communicate about coursework, job training and student progress. Additionally, educational institutions are provided updated information on local employer workforce needs.

Knowledge of Future Training Needs: At Bosch AS, a handful of educators are selected to spend a week at the plant to learn more about the current and future needs of the industry that they can then incorporate into their teaching and curriculum.

SUSTAINABILITY AND OVERCOMING IMPLEMENTATION CHALLENGES

The KY FAME program has been recognized by the U.S. Department of Labor’s National Career Pathway Network as the “Best Career Program in the U.S. (2013).” Neighboring states are applying KY FAME best practices to their own programs. Using the model, Toyota has established programs in its plant communities in Alabama, Indiana, Kentucky, Mississippi, Missouri, Tennessee, Texas and West Virginia. The program is successful because it is an employer-educator partnership led by local employers. Through industry leadership, a program like KY FAME is sustainable. The program continues to grow, with eight chapters established and two more being planned across Kentucky. With the KY FAME model as the foundation of the AMT program, other job functions and pathways can be established, such as tool and die, machine operators, etc.

The KY FAME model is a critical component of strategies to develop and fill the skilled pipeline of industrial technicians within the Kentucky Bluegrass region. At Bosch AS, the next step is to identify high school students in their junior and senior years to complete internships that would serve as a feeder into the KY FAME AMT program.

WORDS OF WISDOM

Recommendations for employers interested in building a similar program within their community include:

Obtain Industry Buy-In: Before launching the Northern Kentucky Chapter of KY FAME, Mike Hirsch visited local manufacturing companies to promote the program as a solution to the skills gap. For a program of this size to be successful, employers must take a leadership role.

Build a Robust Recruiting Strategy Through Grassroots Effort: To recruit for the Northern Kentucky FAME Chapter, Mike Hirsch started by meeting with local school superintendents and community college presidents to explain the skills gap in the industry and how the program would address the problem and to request their support. Next, the companies within the Northern Kentucky Chapter held open houses for parents, students and teachers to learn more about the advanced technologies and career paths within manufacturing. These grassroots efforts helped change the perception of manufacturing from dirty and dangerous to a productive and lucrative career pathway opportunity for students.

Be Industry-Led: Following industry’s lead, employers involved regional stakeholders, including economic development/workforce development and local community/technical college partners. Additionally, two to three companies partnered to visit high schools to talk with junior and senior high school students about the KY FAME program as a viable alternative to a four-year degree. Through these efforts, the Northern Kentucky FAME Chapter was able to sponsor 25 students for the first semester of the program.

INFORMATION, TOOLS AND RESOURCES

- Kentucky Skills Network  
  http://thinkkentucky.com/workforce  
- KY FAME  
  www.kyfame.com

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Following are descriptions of the most common and effective work-and-learn models that are a part of business and industry programs nationwide.

**Apprenticeship**
An apprenticeship is a unique, flexible training system that combines job-related technical instruction with structured on-the-job learning experiences. It provides a unique combination of structured learning with on-the-job training from an assigned mentor. Related instruction, technical training or other certified training is provided by apprenticeship training centers, technical schools, community colleges, and/or institutions employing distance and computer-based learning approaches. The goal is to provide workers with advanced skill sets that meet the specific needs of employers. In many cases, these programs provide apprentices the opportunity to simultaneously obtain secondary and postsecondary degrees, as well as credentials issued by third-party industry organizations. (Source: U.S. Department of Labor)

**Career Fair, Career Expo, Job Fair**
A career fair, also called a career expo or job fair, is an event held for employers and recruiters to meet with potential job candidates. Industry representatives set up exhibition booths — usually at a secondary or postsecondary institution — where students and job seekers can find information about different career fields, training opportunities and jobs currently available. Career fairs give employers an opportunity to interact with future job candidates and make direct contact with students who are making decisions about what education, training and career to pursue. Quality career fairs offer hands-on activities to participants, allowing them to see firsthand what a job in the industry entails.

**Clinical Training/Practicum**
Clinical training combines classroom learning with supervised hands-on immersion experiences in specific fields, mostly in industries that involve human services. In health fields, clinical training is founded on actual observation and lab instruction and/or treatment of patients, as distinguished from theoretical or experimental training. The training is usually highly specialized and includes coursework specific to performing functions and tasks in an actual workplace. (Sources: Siemens Clinical Training & Continuing Education; Clinical Training Institute)

**Cooperative Education/Co-Op**
Cooperative education is the integration of classroom theory with practical work experience, through which students alternate attendance at school with periods of professional employment. At the high school level, the periods of classroom and work-based experience are usually half-days. In higher education, the alternation is most often on a longer time scale. Cooperative education programs enable students to apply technical skills already acquired through the education institution in a real-world workplace setting. Traditionally, cooperative education has been used to aid a student’s transition from school to work, while providing participating employers an opportunity to attract, evaluate, train and ultimately employ a ready source of educated and skilled employees. (Sources: Center for Manufacturing Excellence, University of Mississippi; University of Cincinnati)
**Externship**

An externship is typically a training program offered by educational institutions and private businesses that gives students brief practical experiences in their field of study and insight and knowledge in a particular career field. Often shorter term than internships, externships are intensive career learning experiences that typically range from two days to two weeks. Although more immersive and structured than job shadowing, these experiences provide the opportunity for students to see firsthand the work activities and responsibilities in various professions and industries. The experience should provide the learner a greater sense of the knowledge, skills and attributes of people who thrive within that given career pathway and industry sector and a complete experience of day-to-day work life.

**Hands-On Training**

Hands-on training provides student learners an opportunity to use their hands to perform tasks. This training aims to simulate conditions that are as close as possible to real work conditions while avoiding the risks commonly associated with a new employee. In hands-on training, participants typically have the opportunity for repeated practice.

**Industry Tour**

Companies offer guided tours of their facilities to let students, parents and the general public witness firsthand the day-to-day operations of the business. Typically lasting up to two hours, tours are led by knowledgeable staff members who show and describe the companies' processes, products and protocols, as well as point out the skills and training needed for different jobs. Quality industry tours typically result in greater awareness of the company and the industry and increased engagement with the local community, schools and future employees.

**Internship**

An internship is a formal program that provides practical experience for learners in an occupation or profession, during which the learner is immersed in a work situation for a limited period of time. Internships can be paid or unpaid and usually accompany or relate to academic coursework or training. A quality internship provides the learner an increasingly thorough grasp of the career field, extensive experience in specific job functions, application of education and training to specific duties, and a feel for what it is like to work on a daily basis in the industry. While not always intended to result in employment at the sponsoring company, internships help employers expose potential workers to their workplace and industry and recruit, screen and test-fit future job candidates before they are hired full time.

**Job Shadowing**

Job shadowing is a work experience option through which students learn about a job by walking through the working day as a shadow to a competent worker. The job shadowing work experience is a temporary, unpaid exposure to the workplace in an occupational area of interest to the student. Students witness firsthand the work environment, employability and occupational skills in practice, the value of professional training, and potential career options. Job shadowing is designed to increase career awareness, help model student behavior through examples, and reinforce for the student the link between classroom learning and work requirements. Almost any workplace is a potential job-shadowing site. (Source: Paris, K., and Mason, S. (1995). Planning and Implementing Youth Apprenticeship and Work-Based Learning. Madison, WI: University of Wisconsin, Center on Education and Work)

**Mentorship**

Mentorship is the coupling of a novice with an older, more experienced professional wherein the expert shares knowledge and experience with the novice over the course of time. Mentorship can be either formal or informal and can happen face to face; online; or in conjunction with other work-and-learn opportunities, such as internships and job shadowing. Mentorships help mentored youth improve their overall academic achievement and develop the necessary skills to enter or continue on a career path. They also provide guidance for decision making. Quality mentorships usually involve mentee training and alignment to the company’s culture and goals.
On-the-Job Training (OJT)
OJT is training by an employer that is provided to a paid participant (either an incoming or incumbent employee) while engaged in productive work in a job that provides knowledge or skills essential to the adequate performance of the job. OJT is usually limited in duration, as appropriate to the occupation for which the participant is being trained, taking into account the content of the training, the prior work experience of the participant and the service strategy of the participant, as appropriate. (Source: Workforce Investment Act)

Pre-Apprenticeship
Pre-apprenticeship is defined by the Employment and Training Administration as “a program or set of strategies [that is] designed to prepare individuals to enter and succeed in a Registered Apprenticeship program and has a documented partnership with at least one, if not more, Registered Apprenticeship program(s).” Since the pre-apprenticeship model is meant to prepare learners to enter a registered apprenticeship, a quality model provides sufficient applied academic training, as well as industry-based technical skills training and practice, to ensure that students transition successfully into an apprenticeship.

Registered Apprenticeship
A registered apprenticeship encompasses the details and benefits listed in the “Apprenticeship” definition. Additionally, it meets national apprenticeship standards outlined by the registration process with the U.S. Department of Labor (DOL) Office of Apprenticeship or through a state apprenticeship agency. Upon completion of a registered apprenticeship program, participants receive a portable credential (provided by DOL or the state apprenticeship agency) that certifies occupational proficiency as a journey worker for the selected occupation. For more information on the DOL registered apprenticeship program, please visit: www.dol.gov/apprenticeship. (Source: U.S. Department of Labor)

Returnship
A returnship is an internship specifically designed for older professionals who have been out of the workforce for an extended period of time to re-enter a career. In many cases, they are designed to help these individuals refresh their skill sets and learn new technologies before returning as full-time employees. Often lasting around 10 weeks, a returnship provides individuals with an opportunity to sharpen their skills in a given career path or pursue new areas of expertise in a work environment that may have changed significantly since their last experience as an employee. Returnships also give employers the opportunity to screen returning experienced applicants before hiring them full time. (Sources: Goldman Sachs; CareerBuilder)

RESOURCES
- 21st Century Competency-Based Apprenticeship Resources http://bit.ly/1RcO4Uh
- U.S. Department of Labor Office of Apprenticeship www.dol.gov/apprenticeship
Contributors

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