



Workforce Development to Meet the Needs of Manufacturers in Alaska

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An Alaska AMBIT Program, Inc. Project

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Statement of Need

Due to an increasing rural population which is widely distributed and often poorly trained the ability to meet the current and future manufacturing of companies in Alaska is greatly impacted. Although most manufacturing is accomplished in the Anchorage area, Alaska as a whole has a distributed manufacturing base. Mining, Information Technology, Shipbuilding, Aerospace, Fishing, Oil, Gas, Transportation, and many traditional manufactures are all striving to meet the needs of technology. Alaskan manufacturers need to be able to take advantage of advancements in productivity enhancing processes, including the design and delivery of products and components through value added supply chains.

Manufactures are unable to acquire and keep properly trained and motivated workers to fill the job growth opportunities in their high growth, high demand sectors. These are economically vital industries for Alaska's growth and future. The result is that many manufactures move these jobs to other states, but more often to other countries. With Alaska's increasing rural population this creates a pool of stranded labor, unable to access Employment or Education and Training.

There are many consultants in the industry which target Alaska and its industries in order to tie into lucrative training and educational contracts. Most consultants however do not understand the unique set of circumstances in which organizations must work around in order to attract and maintain a workforce in Alaska and many try to use the same patterns and methodologies that they have used in California and New York. One of these sets of competencies is titled "lean" manufacturing which has been the buzz-word of choice since consultant types determined that US manufacturing must follow Japanese principles.

Those principles were of course created by W. Edwards Deming for shipbuilding prior to and during WWII and were transmitted to Japan through the military and the Department of State. Deming called these principles Quality Management Systems, but regardless of what they are called the impacts that they can have are significant and when applied to ship building reduce time and costs per ship.

1. Innovative Solutions

In order to ensure that manufacturing organizations can find properly trained employees to fill open positions, and so that the employees do not relocate to other states or countries, we propose a multi-step process to grow an Alaska workforce. The hierarchy of the model for manufacturing competencies in advanced manufacturing industries is based on process and project management.

To accomplish this, we propose a multi-tiered highly connected partnership relationship between educational providers ranging from private consultants, universities, State level programs such as the Department of Labor, Alaska Manufacturing Extension Partnership, and the businesses in the manufacturing industry. We recognize that the labor pool in Alaska ranges in Education and Training from the illiterate with no skills to the highly educated business center of Anchorage where 40% of workers are people who have a minimum of an associate degree.

A short survey of Potential Manufacturing Strategic Partners was conducted to determine real potential work force need. The results correlated closely with the description provided with the industry technological competencies list. The solution most demanded by Alaskan high technology manufacturing to fulfill workforce needs is individuals with a desire to learn and grow. The second need was to provide training to incumbent workers without removing them from the labor pool. The third was that the participants are not distracted with pure academic programs normally associated with a University education. Our purposed solution is to attract and assess each individual to determine the current level of education and training they possess to target them at appropriate fulfillment opportunity.

Each individual will be assessed to determine where they are on a career ladder outlined by the US Department of Labor as having eight levels

1. Personal Effectiveness (work ethic, basic level understanding)
2. Academic Competency (able to read, write and accomplish basic math)
3. Workplace Competency (able to follow standard operating procedures)
4. Industry-wide Technical Competency (see outline of training program year 1)
5. Industry Sector Competency (see outline of training program year 2 & 3)
6. Occupational Specific Knowledge Areas (Degree acquisition)
7. Occupational Specific Technical Competencies (mentored OJT)
8. Occupational Specific Requirements (Advanced certifications)

If they are in levels 1 and 2, they will be connected with an appropriate educational provider. If they are ready to begin to start working toward the industry wide technical competencies, they will be enrolled in AMBIT' specifically designed Advance Manufacturing Competencies courses year 1.

These courses are:

Year 1:

1. Lean & Six Sigma based Project Management & MFG skills (6 months)
2. Design & Documentation of MFG processes and Supply Chain (3 months)
3. Tooling, Fabrication, & Assembly of MFG products (6 weeks)
4. Maintenance, Regulation, Health & Safety MFG Requirements (6 weeks)

Year 2:

1. Process, Production, Project Management & Quality Control (6 months)
2. Advanced MFG Technologies and Regulatory Requirements (6 months)

Year 3:

1. Advanced MFG Process Engineering, Analysis, R&D, and Auditing (6 months)

2. Advanced MFG Management Skills & Leadership (6 months)

Each course will be divided up into “Knowledge Chunks” or small learning modules that can be acquired and internalized in a very short period of time, in some cases less than an hour. They can be made available to participants with hand-held devices where needed so as not to interrupt the work environment. This gives the participant the ability to immediately apply what they have learned and provides the employer with a very quick ROI to cover the cost of training. As each participant gains in knowledge, their on-the-job abilities and responsibilities will grow and since the learning will be based on actual projects being accomplished at the students work position it will drive the industry specific learning

All of these courses will be based on the competencies outlined for advanced manufacturing by USDOL and build toward understanding and application in the work environment. Competency List as follows: R&D, CAD/CAM, Statistical process control, problem solving, documentation, Lean MFG, Six Sigma, automation, testing, assembly, fabrication, clean-room procedures, design, hand tools, basic AC/DC elect, maintenance, health & safety, OSHA, supply chain, inventory control, work-flow, packaging, distribution, QA/QC, bar coding, design of experiments, product life cycle, tool design, system design, nano-tech, RFID, calibration, org design, engineering principles, root cause analysis, scheduling, ergonomics, benchmarking, presentation skills, computer skills, business case analysis, facilitation skills, factor analysis, capability planning, inspection & test, sampling, ISO, and Baldrige.

For level (6) Occupational Specific Knowledge we will aggregate the needs of our manufacturing partners and develop and deliver a targeted solution, by retaining the services of subject matter experts to design and deliver a curriculum to meet the technological needs. This will be true for level (7) occupational specific technical competencies. All Educational and Training courses in AMBIT portfolio are audited and accredited through universities possessing regional accreditation. Therefore all courses in AMBIT portfolio may be used toward a degree or certification with one of the nationally recognized certification bodies, such as ASQ.

AMBIT already has much of the proposed curriculum created and would work closely with university systems to ensure accreditation. AMBIT curriculum is currently accredited by out of state schools and universities but is actively seeking to have the University of Alaska system recognize the value in both the relationship and the follow-on programs that they would be able to offer in conjunction with this program. That being said; AMBIT is driving ahead to ensure that manufacturers in Alaska have access to the kinds of training and education programs that they have identified as being critical to success.

Levels 1 & 2 obviously target the core curriculum that the university and community colleges are already set to provide as long as funding through a state wide program is available. Level 3 accounts for a large part of what most manufacturers are already training in-house. AMBIT has no desire to try and provide the skill sets in levels 1,2, and 3 but will gladly facilitate the connections to the prospective schools and if it can be provided in-state we will make that arrangement, but if we have to go out of state, many organizations and schools are already lining up to provide this service.

Our goal at AMBIT is to accomplish as much of the needed training and education in state as possible and believe we can get up to 100% due to the relationships we have already established. However, it is our contention that the management of this kind of program is best accomplished if managed by AMBIT or a similar entity and not placed into the university system.

Work Force Challenge

Due to the wide geographic distribution of the rural population, access to training and education, programs at times are limited. Travel must almost always be by air and is expensive. Alaska has a high dropout rate for high school students especially in the rural area and this rate approaching 40%. Manufacturers try to locate close to the population centers but many Manufacturing, Construction, Mining, and Energy Projects are connected to geographic located area resources and this is especially true for ship building. Therefore, all of these T&E programs will be available online as well as in the classroom.

While most Alaskan natives speak English the ability to communicate clearly is often at a low level and with the high dropout rate reading, writing, and language skills are often mediocre at best. Although this is changing for the better, a large portion of the population does not have the language skills needed in the advanced manufacturing environment.

Alaska is the destination of choice for immigrants both legal and illegal, and many do not have the language or business skills needed by Alaska manufacturers.

Alaska based advanced manufacturing is small but growing. There are currently less than 500 registered manufacturers in the state of Alaska not including home based manufacturing. 95% of rural manufacturing jobs are employed by micro enterprise businesses consisting of 5 employees or less.

To fulfill training needs activities of level (4) Education and Training skill sets by AMBIT have been outlined for a 3 year progressively tier education and training program.

This program takes an individual from the awareness needed in a manufacturing environment up through the technological competencies required to enter into the manufacturing management ranks. Since all the training is participant centered and accredited, the student can define a career pathway. The entry level education and training program of AMBIT advance manufacturing competency courses is composed of 4 courses to be covered in 12 months each encompassing specific knowledge areas. All these courses will be Project based which means the participant will select a manufacturing related project and build it out, following the method covered in the education and training project course.