Request for Proposal (RFP): Development of a U.S. Robotics and Artificial Intelligence Training and Education Programs System and Database

RFP Number: 25-01
Release Date: July 15, 2025
Response Deadline: August 15, 2025
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1. Overview

The ARM (Advanced Robotics for Manufacturing) Institute is a Manufacturing Innovation Institute (MII) funded by the Office of the Secretary of Defense under Agreement Number W911NF-17-3-0004, and part of the Manufacturing USA® network.

The ARM Institute is seeking proposals from qualified service providers to add functionality to its national workforce web-based platform, www.roboticscareer.org which currently offers a comprehensive, structured database of training and education programs offered by training providers in the United States that are aligned with the ARM Institute Robotics Competency Framework.

The existing content database was built and is managed manually and includes descriptions of almost 17,000 programs from over 2,400 training providers. The ARM Institute is seeking a solution provider to create an automated system ("**System**") that is integrated with the RoboticsCareer digital platform for the collection, validation, and maintenance of training and education providers and their relevant programs. As part of the solution, the data collected must include specific attributes which are outlined in the statement of work.

The new functionality must be able to identify, validate, and keep current several different training provider and program attributes such as type of degree, how offered (online, hybrid) and other elements as identified in Section 3.2.

This is work for hire; the source code will be owned by the ARM Institute, although we anticipate working with the Solution Provider for enhancements.

The data collected must be easily accessed for data analytics and reporting.

2. Project Goals

- Create the capability for the **System** to provide a comprehensive, accurate, and current list of training, inclusive of education providers and relevant programs which are publicly available in the U.S. and territories that are aligned to current and future competency frameworks provided by the ARM Institute (see Scope of Work).
- Ensure that the **System** can systematically perform content management queries to ensure currency of training provider and program details on this extensive database.
- Identify accredited and non-accredited training programs and differentiate clearly between **degree-granting** and **certificate/non-degree** programs.
- Deliver a structured, exportable database with all specified data fields that is compatible with roboticscareer.org data structures.
- Provide an administrative interface on the **System** to access the data and run queries.

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3. Scope of Work

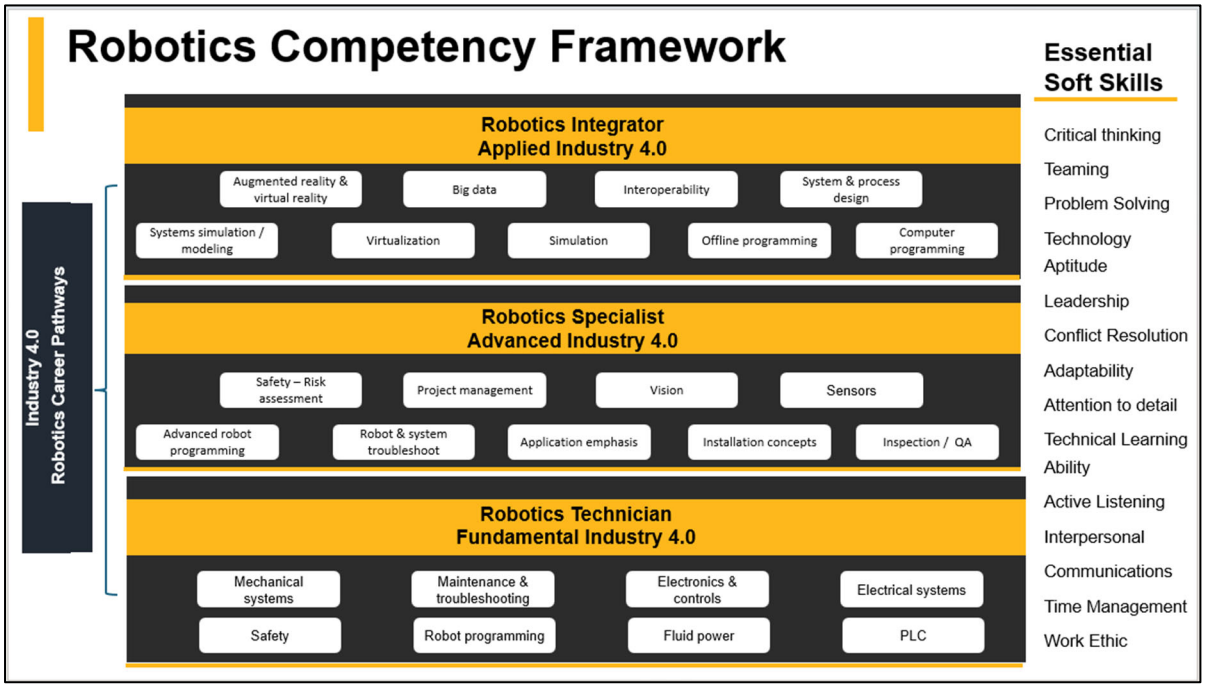
The selected vendor will be responsible for the following:

3.1 Data Collection & Processing

- Access public websites of U.S.-based academic institutions, training providers, education marketplaces. and technical and vocational institution providers to build/update/maintain a comprehensive list of training providers and programs that are aligned to the ARM Institute's current and future competency frameworks. The ARM Institute anticipates this could eventually include 20+ competency frameworks.
- Additionally, include training programs from robotics manufacturers, advanced manufacturing training facilities, apprenticeship programs, K-12 charter schools and K-12 stem academies and other sources of U.S. based programs that offer education and certifications for advanced manufacturing training, with a current focus on robotics and AI related programs.
- Support the initial frameworks for the **System** which include the ARM Institute Competency Frameworks for Robotics and Artificial Intelligence which are listed below. Initially, the database should extract programs that align to the

competencies and soft skills listed in these frameworks. Competencies and soft skills are two separate attributes that are needed for each training program.

- As mentioned above, The ARM Institute anticipates using the **System** for additional manufacturing competency frameworks. So, the **System** will need the ability to identify education providers and programs that meet the competencies specified in these new frameworks. The solution will be required to compare and normalize competencies across the existing and new frameworks.



Competencies of a Robotics Technician

- Mechanical Systems
- Maintenance & Troubleshooting
- Electronics & Controls
- Electrical Systems
- Safety (Systems and Procedures)
- Robot Programming
- Fluid Power
- PLC (Programmable Logic Controller)

Competencies of a Robotics Specialist

- Safety - Risk Assessment
- Project Management
- Vision
- Sensors
- Advanced Robot Programming
- Robot / System Troubleshooting
- Application Emphasis
- Installation Concepts
- Inspection / Quality Assurance

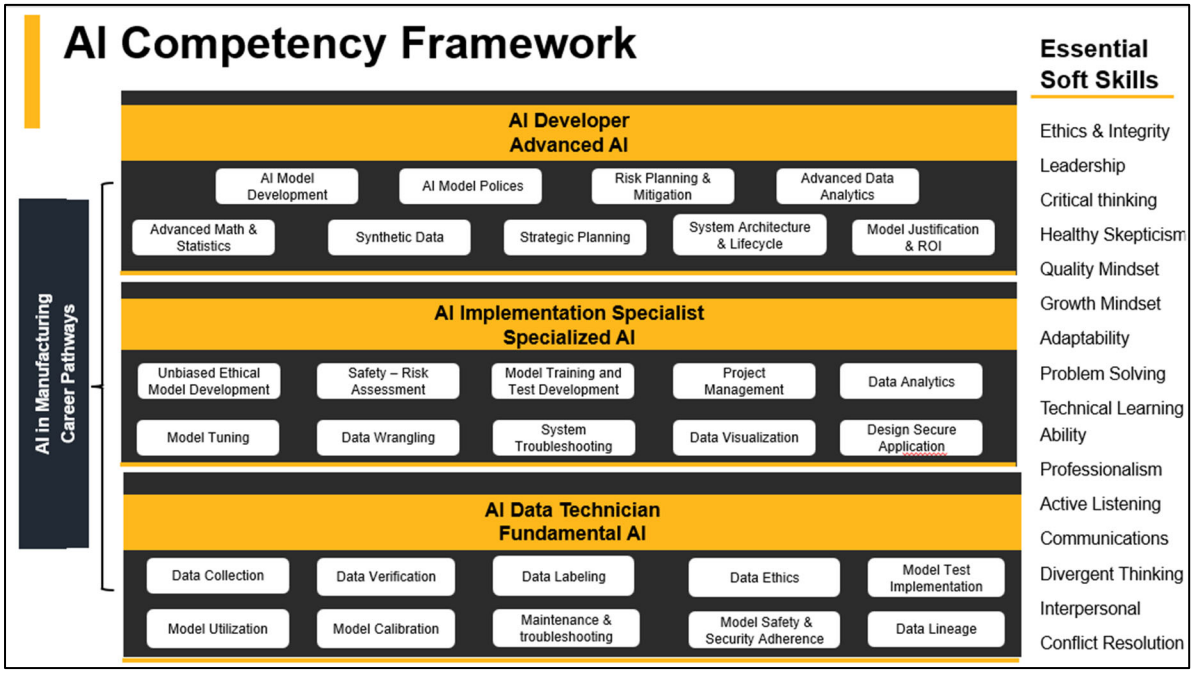
Competencies of a Robotics Integrator

- Augmented Reality / Virtual Reality
- Big Data
- Interoperability
- System Simulation / Modeling
- Systems & Process Design
- Visualization
- Simulation
- Offline Programming
- Computer Programming

Essential Soft Skills for Robotics Career Pathways

- Critical Thinking
- Teaming
- Problem Solving
- Technology Aptitude
- Leadership
- Conflict Resolution
- Adaptability
- Attention to Detail
- Technical Learning Ability
- Active Listening
- Interpersonal Skills

- Communication
- Time Management
- Work Ethic



Competencies of an AI Data Technician (Fundamental AI)

- Data Collection
- Data Verification
- Data Labeling
- Data Ethics:
- Model Test Implementation:
- Model Utilization
- Model Calibration
- AI Model Safety & Security Adherence
- Data Lineage

Competencies of an AI Implementation Specialist (Specialized/Intermediate AI)

- Model Ethics – Unbiased Development
- Safety – Risk Assessment
- Data Wrangling

- Model Tuning
- Model Training and Test Development
- System Troubleshooting
- Project Management
- Data Visualization
- Data Analytics
- Design Structure Application

Competencies of an AI Developer (Advanced AI)

- Advanced Math & Statistics
- AI Model Development
- Synthetic Data
- AI Model Policies
- Strategic Planning
- System Architecture and Lifecycle
- Advanced Data Analytics
- Risk Planning and Mitigation
- Model Justification and ROI

Essential Soft Skills for AI Skills

- Ethics & Integrity
- Leadership
- Critical Thinking
- Healthy Skepticism
- Quality Mindset
- Adaptability
- Growth Mindset
- Problem-Solving
- Technical Learning Ability
- Professionalism
- Active Listening
- Communication
- Divergent Thinking
- Interpersonal Skills
- Conflict Resolution

3.2 Database Design & Delivery

Each program entry must include the following fields:

- **Training Provider Name**
- **Training Provider Description**
- **Training Provider Type**
    - Advanced Manufacturing Certification Program
    - Advanced Manufacturing Training Facility
    - Apprenticeship Program
    - Community College
    - Economic Development Program
    - For-Profit Advanced Manufacturing Training Program
    - For-Profit Training Organization
    - Historically Black College or University
    - K-12 Charter School for Technology
    - K-12 Public School
    - Manufacturing Recruiting/Training Organization
    - Private College or University
    - Public College or University
    - Robotic Manufacturer
    - STEM/STEAM Program
    - Technical College
- **Training Provider Industry**
    - Aerospace
    - Automotive
    - Chemicals & Materials
    - Composites
    - Construction & Heavy Machinery
    - Education
    - Electronics
    - Energy & Utilities
    - Food and Beverage
    - Industrial

- Logistics
- Manufacturing
- Medical Devices
- Metals & Mining
- Non-Profit
- Other
- Pharmaceuticals
- Research
- Semiconductor
- Textiles & Apparel
- Transportation

- **Training Provider Location (**Address, City, State, Zip-Code**)**
- **Program Name/Title**
- **Program Description**
- **Program Location** (City, State, and Online/Onsite)
- **Program Contact** (name, email, phone)
- **Program Contact Title** (what is the role of the contact)
- **Credential Earned** (Degree (Associate, Bachelor, Master, Doctorate), Certificate (Certificate of completion, Journeyman Certificate, Micro-credential, Workforce Certificate), Other (Academic Credit, Apprenticeship, Industry/On-the-job Training)
- **Program URL** (Hyperlink to Official Program Webpage)
- **Tuition/Program Cost** (if publicly available)
- **Program Format** (onsite, online, hybrid)
- **Program Type** (Degree, Certificate/non-degree/other)
- **Program Length** (<3 months, <1 year, 1-2 years, 3-4 years, 5 or more years)
- **Competency Matches** (list of individual robotics and artificial intelligence competencies that match with the ARM Institute frameworks)
- **Soft Skill Matches** (based on frameworks provided by the ARM Institute)

- **Target Audience** (Learner (adult, economically disadvantaged populations, minorities, individuals with disabilities, K-12 students, women, underrepresented populations, veterans), or Instructor)
- **Classification of Instructional Program Code** (where appropriate include the U.S. Dept of Education CIP code)
- Other fields as determined once we get more insight into the content collected

3.3 Functional Requirements

- The database must be available in one or more of the following formats: PostgreSQL/MySQL, CSV, or via a REST API.
- Records must be deduplicated and normalized.
- Data must be updatable quarterly with no or minimal manual intervention.
- Requirements for Program Data:
    - A predictable, consistent, and easily parsed data structure in a digestible format either JSON (preferably) or .CSV.
    - A standardized library of soft skills and competencies assigned to training programs, which can be mapped to the ARM Institute competencies.
    - Consistent (normalized) tagging for key program attributes (for example, courses delivered online should always use a single tag—not “Virtual,” “online,” or “online” interchangeably).
    - The ARM Institute will provide the tags. Examples of key tags include:
        - State
        - City
        - Credential (e.g., Bachelor's, Associate's, Certificate, etc.)
        - Program Length
    - A comprehensive list of Programs at a given point in time including Program Status since last data set
        - New
        - Existing - No update
        - Existing - Updated
        - Removed

4. Deliverables

1. **Initial phase:** A **System** that provides complete database of U.S. training providers and programs that map to the ARM Institute Robotics and Artificial Intelligence competency frameworks**.** This system will need capabilities to expand to additional (at least 20) competency frameworks over the next 2 years. It also must be flexible enough for changing competencies for each framework.
2. **Database of training providers and program** that meet the fields specified above. Deliverable should include validation of the data.
3. **Code base:** Code hosted on ARM Institute servers or proxies.
4. **Documentation**, including:
    - Data schema
    - Data sources
    - Extraction and classification methodologies
5. **Tooling & Scripts**, if applicable, to support updates or expansion.
6. **Administration**: Web-based interface for browsing and searching the dataset.
7. **Training:** Training on the usage of the **System** for the ARM Institute team.
8. **Support Plan**: Plan that provides technical and customer support for a period of three years.
9. Note that code, data collected and supporting assets will be owned by the ARM Institute.

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5. Proposal Requirements

Proposals must include the following:

1. **Company Background** and relevant experience with similar projects.
2. **Project Methodology**, including data collection, processing, and classification approach.
3. **Technology Stack** and tools (e.g., NLP, ML, scraping frameworks).

    1. Note that any third-party applications included in the proposal must include the licensing terms and cost.

4. **Project Timeline**, including major milestones.
5. **Customer Service / Maintenance Plan,** including a detailed plan and policy for customer service, and how the vendor will respond to service issues and questions in a timely manner.
6. **Cost Proposal**, itemized by phase, with optional recurring maintenance costs.
7. **Sample Output**, small sample of extracted program data.
8. **References** from previous clients with similar scopes.
9. **Litigation,** a summary of all litigation actions involving your company within the last five (5) years.

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6. Evaluation Criteria

Proposals will be evaluated based on the following weighted scoring System:

Criterion	Weight
Technical Approach & Methodology	30%
Experience & Past Performance	20%
Accuracy & Classification Capabilities	20%
Cost & Value for Money	20%
Scalability & Maintainability	10%

Shortlisted vendors will be asked to participate in interviews or demos before final selection.

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7. Submission Instructions

All proposals must be submitted electronically in PDF format to:
john.zappa@arminstitute.org

Subject line: Proposal for Robotics and AI Education Program System and Database – [Vendor Name]

Deadline: August 15, 2025

Late submissions will not be considered.

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8. Terms and Conditions

a. **Withdrawal of Proposal**

Proposals may be withdrawn at any time prior to the submission time specified in this RFP, provided notification is received in writing. Proposals cannot be changed or withdrawn after the time designated for receipt.

b. **Proposal Validity Period**

Submission of the proposal will signify the vendor's agreement that its proposal and the content thereof are valid for 90 days following the submission deadline and will become part of the contract that is negotiated between ARM Institute and the awarded vendor.

c. **RFP Revisions**

ARM Institute reserves the right to change the schedule or issue amendments to the RFP at any time. ARM Institute also reserves the right to cancel or reissue the RFP at any time. Amendments or a notice of cancellation will be posted to the ARM Institute's website. It is the sole responsibility of the proposer to monitor the website for the posting of such information.

d. **Compensation**

No payment of any kind will be provided to the submitting vendor, or parties they represent, for obtaining any of the information requested. Procurement of all equipment and services will be in accordance with subsequent contractual action.

e. **Commitments**

All quotes should be submitted initially on the most complete basis and with the most favorable financial terms available. The selected vendor's proposal may, at ARM Institute's option, be made part of the final purchase contract and all

representations in the vendor's proposal may be considered commitments to supply the system as described.

The ARM Institute reserves the right to accept or reject any proposal without obligation.

f. Selection Process and Contract Award

i. All proposals will be reviewed and screened based upon the requirements outlined in this request.

ii. It is the intention of ARM Institute to issue a contract to the vendor whose proposal is deemed to be the best fit and in the best interest of ARM Institute, however, ARM Institute does not guarantee award based on this RFP. ARM Institute reserves the right to reject or cancel all proposals. Proposals lacking required information will not be considered. The award of the contract is subject to approval by ARM Institute.

iii. The selection process will proceed on the following sequence:

- Proposals Due
- Proposal review and interviews
- Notification of selection
- Contract negotiation, approval, and signature

iv. The vendor selected will be expected to enter into a contract with ARM Institute on terms in ARM Institute's standard Professional Services Agreement. If the selected vendor fails to sign and return the contract within twenty (20) business days of delivery of the final contract, ARM Institute may elect to cancel the award and award the contract to the next-highest-ranked vendor.

v. No costs chargeable to the proposed contract may be incurred before the vendor has received a fully executed contract.

g. Ownership

All data and code produced under the contract will become the sole and exclusive property of the ARM Institute, including the System, its underlying database and data, including all documentation, modifications, improvements, upgrades, derivative words, and all other Intellectual Property rights in connection with the System.