



AI Policy Version 1.0: CTDL Development, Publishing to the Credential Registry, and Using Registry Data

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Table of Contents

[The Necessity and Value of Structured Data, CTDL, and AI Integration](#)

[Introduction](#)

[1. Purpose](#)

[2. Review and Updates](#)

[3. Scope](#)

[4. AI Objectives and Strategy](#)

[5. Guidelines](#)

[5.1 Ethical Use](#)

[5.2 Data Privacy and Security](#)

[5.3 Quality Assurance](#)

[5.4 Training and Support](#)

[5.5 Oversight and Accountability](#)

[5.6 Monitoring and Evaluation](#)

[5.7 Policy Breaches and Misuse](#)

[6. Generative AI Tools Guidelines](#)

[6.1 Compliance with Policies](#)

[6.2 Prohibition of Inputting Confidential Content](#)

[7. Credential Engine-Provided or Recommended AI Tools](#)

[7.1 Standardized Tools](#)

[7.2 Selection of Tools](#)

[7.3 Usage Guidelines](#)

[8. Specific Areas of Application](#)

[8.1 Developing and Maintaining CTDL](#)

[8.2 Publishing to the Credential Registry](#)

[8.3 Using CTDL and Registry Data for AI Training or AI-Powered Products](#)

The Necessity and Value of Structured Data, CTDL, and AI Integration

The integration of Artificial Intelligence (AI) with structured data is revolutionizing how educational institutions, credential providers, product vendors, government agencies, and other stakeholders create data-driven solutions. Central to this transformation are the Credential Transparency Description Language (CTDL) and the Credential Registry.

Importance of Structured Data Structured data, organized systematically with clear identifiers and relationships, is essential for AI systems. It allows data to be easily understood, searched, analyzed, and processed, leading to more accurate and effective AI applications.

CTDL as a Linked Open Data Schema CTDL, encompassing numerous primary classes and three integrated schemas, provides a comprehensive framework for organizing credential and skill data:

- **CTDL** covers credentials, learning opportunities, assessments, learning and work pathways, jobs, tasks, work roles, and more.
- **CTDL ASN** covers competencies/skills, rubrics, progression models, and concept schemes.
- **Quantitative Data** covers education and employment outcome metrics.

This structured and consistent format clearly defines relationships between various educational and occupational elements. Additionally, CTDL defines every single term included within the schema, providing clear semantic meaning and ensuring that all data elements are precisely understood by both humans and machines. This enables AI tools to efficiently analyze patterns and make valuable connections.

Credential Registry: Data Store for CTDL-Structured Resources The Credential Registry serves as a data store for resources structured according to the CTDL linked open data format. This registry ensures that data is consistently formatted and organized, making it highly useful for training and refining AI models and for use with AI-powered services or products. The extensive body of CTDL data within the registry enhances AI applications by providing a rich source of structured information.

Enhancing AI Applications The combination of CTDL and AI has the potential to transform key areas such as:

- Skills mapping
- Learning opportunity recommendations
- Career exploration

- Data-driven decision making
- Educational and career pathway development
- Competency-based education and training
- Workforce planning and development

Credential Engine is dedicated to providing reliable and consistent structured data to power these AI applications. By leveraging CTDL's rich data schema and the extensive data in the Credential Registry, we aim to support innovative and effective AI solutions.

Call To Action: Essential information about education and occupational credentials and skills should be available as structured data in CTDL to be most valuable for A.I.-driven tools and services.

For more information, read our detailed article on the [Value of CTDL for AI](#).

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Introduction

This policy outlines the guidelines for the development, publication, and use of Credential Transparency Description Language (CTDL) and Credential Registry data using AI tools. The aim is to ensure the ethical, effective, and secure utilization of AI technologies in these specific areas to enhance productivity, scale, market coverage, data quality, innovation, and trustworthy value for users. AI tools are intended to support and augment human efforts rather than replace them. Effective use of AI requires proper prompting, training, and collaboration among staff and external stakeholders. This policy provides a framework for leveraging AI in developing and maintaining CTDL, publishing to the Credential Registry, and using Registry data for AI training or AI-powered products, ensuring all processes are carried out responsibly and transparently.

1. Purpose

This policy outlines the guidelines for using AI tools associated with Credential Engine, CTDL, and Registry data. The aim is to ensure ethical, effective, and secure utilization of AI technologies by internal staff, external staff and consultants, and partners who create Credential Registry accounts to utilize data publishing tools and consuming options or customers who export data from the Credential Finder or Credential Finder widgets.

This policy covers three key areas:

- ***Developing the Credential Transparency Description Language (CTDL)***
- ***Publishing to the Credential Registry***
- ***Using CTDL and Registry data for AI training or AI-powered products***

2. Review and Updates

This policy will be reviewed annually or as needed to ensure it remains relevant and effective. Updates will be communicated to all staff members and partners.

3. Scope

This policy applies to all Credential Engine internal staff members, external staff, contractors, and partners using AI tools in the following areas:

- Developing and Maintaining CTDL: Utilizing AI for structuring data, developing terms and definitions, identifying modeling options, and mapping CTDL to other schemas.
- Publishing to the Credential Registry: Using AI tools to prepare and publish data, including metadata extraction and utilizing any of the Credential Registry publishing system options.
- Using CTDL and Registry Data for AI Training or AI-Powered Products: Leveraging AI to train models and develop products based on Credential Registry data.

4. AI Objectives and Strategy

Credential Engine's AI strategy aims to leverage AI tools to enhance productivity, ensure data quality, support creativity, and enable data-driven decision-making across the three key areas outlined in the Scope. The objectives include:

- Enhancing Productivity: Streamlining tasks such as data modeling, mapping, and other types of data preparation, including editing and publishing.
- Expanding Market Coverage: Developing scalable means to publish more and more data in CTDL to the Registry.
- Supporting Creativity: Enabling innovative solutions and improving modeling and mapping processes.
- Ensuring Quality: Maintaining high standards of accuracy and reliability in AI outputs.
- Promoting Ethical Use: Upholding ethical standards, data privacy, and security in all AI applications.
- Human Oversight: Ensure all AI workflows include human oversight to maintain accuracy and reliability.

5. Guidelines

5.1 Ethical Use

- **Alignment with Values:** AI tools must be used in ways that align with Credential Engine's values and ethical standards.
- **Bias and Fairness:** Ensure AI outputs are free from bias and promote fairness. Regularly audit AI tools for biases and take corrective action when necessary.

- **Transparency:** Be transparent about the use of AI tools. Inform staff, partners, and customers when AI tools are used and ensure they understand how these tools function.

5.2 Data Privacy and Security

- **Confidentiality:** Handle all data processed by AI tools with utmost confidentiality. Protect sensitive information according to Credential Engine's [data privacy policies](#).
- **Data Protection:** Ensure AI tools comply with data protection regulations and that AI vendors have robust data security measures.

5.3 Quality Assurance

- **Accuracy:** Regularly verify the accuracy and reliability of AI-generated outputs. Implement a review process to ensure quality.
- **Validation:** Conduct regular audits and validations of AI tools to maintain high standards of performance.

5.4 Training and Support

- **Staff Training:** Provide training on the use of AI tools. Ensure staff understand how to effectively use these tools and are aware of potential risks.
- **Customer Training:** Offer service packages and openly available resources about CTDL and the Credential Registry along with guidance for customers using AI tools provided by Credential Engine.
- **Ongoing Support:** Offer continuous support and resources for both staff and customers using AI tools. Provide access to troubleshooting and assistance when needed through self-access resources and service packages.

5.5 Oversight and Accountability

- **Assigned Responsibilities:** Designate specific roles responsible for overseeing the use of AI tools. Ensure compliance with this policy and address any issues that arise.
- **Incident Management:** Establish procedures for reporting and managing incidents related to AI tool use, including data breaches and ethical concerns.

5.6 Monitoring and Evaluation

- **Usage:** Track the impact of AI tools on productivity, quality, and workflow. Ensure data collected is used ethically and responsibly.

- **Performance Tracking:** Monitor the impact of AI tools on productivity and workflow. Use data-driven insights to make informed decisions on AI tool usage.
- **Feedback Mechanism:** Implement a feedback mechanism for staff and customers to report experiences and suggest improvements for AI tool usage, enhancing the overall effectiveness of AI tools.
- **Review:** Regularly review the monitoring processes to ensure they are fair and transparent.

5.7 Policy Breaches and Misuse

- **Reporting Breaches and Misuse:** Staff, partners, and customers are required to report any breaches of this policy or misuse of AI tools. Reports should be made to [Designated Contact Person/Department].
- **Incident Management:** Credential Engine will investigate all reported breaches and misuse of AI tools. Employees and customers are expected to cooperate fully with internal inquiries.
- **Disciplinary Actions:** Breaches of this policy or misuse of AI tools may result in disciplinary action for staff, up to and including termination of employment. Partners and customers may face restrictions or termination of their access to Credential Engine services. Actions will be taken in accordance with Credential Engine's disciplinary procedures.

6. Generative AI Tools Guidelines

Description of Generative AI Tools

Generative AI tools use machine learning models to generate new content based on input data. These tools can create text, images, audio, and other media by learning patterns from large datasets.

6.1 Compliance with Policies

- **Consistency:** Ensure the use of generative AI tools is consistent with all organizational policies.
- **Responsibility:** Ensure the resulting work product from generative AI tools is high-quality, accurate, and does not infringe on any third-party intellectual property rights.

6.2 Prohibition of Inputting Confidential Content

- **Confidentiality:** Do not input any confidential or proprietary content provided by external entities into generative AI tools. Such use can expose sensitive information and is not aligned with confidentiality expectations.

7. Credential Engine-Provided or Recommended AI Tools

7.1 Standardized Tools

- **AI Tools:** Credential Engine will continue to assess and provide standardized AI tools for developing and maintaining CTDL, publishing to the Credential Registry, and using Registry data for AI training or AI-powered products. Staff and customers will be informed and trained on any new tools as they are made available.
- **Current Tool Offering:** Credential Engine is offering partner and customer access to an AI-assisted webpage crawler for obtaining CTDL data. Key features and functionality include:
 - **Data Collection:** Obtains CTDL data, such as courses, from public websites with permission from the organization that owns the website. Downloads relevant information from the website.
 - **Data Transformation:** Transforms downloaded data into CTDL in an upload-ready format. Utilizes pre-defined Credential Registry Publishing System bulk upload templates.
 - **Data Review and Upload:** Requires people to review the data populated in the predefined template. Uploads reviewed data via the Credential Registry Publishing System.
 - **Future Expansion:** Expected to expand functionality to multiple CTDL classes, including but not limited to courses, learning programs, credentials, and competencies. Anticipated increase in reliability and demand for using this tool to publish to the Registry, greatly improving efficiencies.

7.2 Selection of Tools

- **Measuring Effectiveness:** Many AI-powered tools are available now and many more will be coming in the future. Tools will need to be selected based on pre-defined measures of effectiveness. This policy does not address rubrics for assessing tools.
- **Reliability and Consistency:** AI can be helpful but understanding some fundamentals of how it works is key. AI tools generally fall into two categories: deterministic and non-deterministic.
 - **Deterministic algorithms** are predictable and produce the same result with the same input, making them ideal for tasks needing consistent outcomes.
 - **Non-deterministic algorithms**, used by most AI tools, can yield different results with the same input due to their probabilistic nature. This makes them excellent for generating alternative solutions and

creative ideas. For tasks requiring specific and reliable answers, AI's non-deterministic nature might not always provide consistency. Therefore, it's essential to rigorously review and test AI-generated results to ensure accuracy and reliability.

7.3 Usage Guidelines

- **Consistency:** Where applicable, use Credential Engine-provided or recommended AI tools for relevant tasks to ensure consistency and quality across the organization.
- **Training:** Participate in training sessions for any new AI tools provided by Credential Engine to ensure effective and responsible use.

8. Specific Areas of Application

Introduction to Specific Areas of AI Application

All the above guidelines and policies are relevant to each of the areas below. This section provides additional details and policies specific to developing and maintaining CTDL, publishing to the Credential Registry, and using Registry data for AI training or AI-powered products. Utilizing AI in these areas requires rigor in the review process. It is essential to maintain a high level of accuracy and reliability when reviewing output from AI and not to assume its correctness without thorough validation. The key categories applicable to each area are:

- **Usage:** Define how AI tools should be utilized to effectively support the specific tasks.
- **Review:** Ensure that AI-generated outputs are regularly reviewed by subject matter experts.
- **Disclosure:** Maintain transparency about the use of AI tools in the processes.
- **Validation:** Regularly audit and validate AI-generated outputs to ensure they meet Credential Engine standards.
- **Compliance:** Ensure AI-generated outputs adhere to Credential Engine's standards and best practices.
- **Data Protection:** Follow data protection policies to ensure the confidentiality and security of all data used in AI tools.

8.1 Developing and Maintaining CTDL

This policy applies to all Credential Engine internal staff members, external staff, contractors, collaborators, and partners using AI tools for developing and maintaining the Credential Transparency Description Language (CTDL). AI can support various areas of CTDL development, including:

- **Determining Priorities:** Leveraging AI tools to analyze data and help set development priorities.
- **Accelerating Processes:** Using AI to speed up various development processes.
- **Research and Development:** Employing AI for research purposes and to drive innovation in CTDL.
- **Data Modeling:** Utilizing AI for structuring and organizing data.
- **Terms Development:** Applying AI to develop and refine terms and definitions.
- **Schema Mapping:** Using AI to map CTDL to other schemas.
- **Analyzing and Utilizing Feedback:** Using AI to analyze feedback gathered via multiple processes and integrating feedback with terms proposals.

All CTDL development is carried out by Credential Engine's CTDL team. Significant development must follow the CTDL Significant Update Policy, involving subject matter experts in time-limited task groups. Significant updates are determined based on the CTDL Annual Plan of Work with input from the CTDL Advisory Group, state partners, and other stakeholders in the learn-and-work ecosystem. The development processes aim for durable results and require expertise to lead, manage, maintain, get feedback on, and expand the CTDL. As AI's reliability evolves, it will aid in scalability and other related work on the development and maintenance of the CTDL.

- **Usage:** Utilize AI tools for CTDL development in areas such as structuring data, developing terms and definitions, identifying modeling options, and mapping CTDL to other schemas.
- **Review:** Ensure that all AI-assisted outputs are reviewed by subject matter experts to maintain accuracy and reliability. Conduct periodic reviews of AI tool outputs to ensure they meet Credential Engine's quality standards.
- **Disclosure:** Inform Credential Engine's CTDL team when AI tools are used in the development and maintenance of CTDL. Inform stakeholders when Credential Engine's AI tools are used in the development and maintenance of CTDL.
- **Validation:** Conduct regular audits and validations of AI-generated CTDL outputs to maintain high standards of performance. Conduct regular audits of AI-generated CTDL outputs to ensure they meet Credential Engine's quality standards.
- **Compliance:** Ensure AI-generated outputs adhere to Credential Engine's standards and best practices for CTDL development and maintenance. Establish and enforce standards and best practices for AI-assisted CTDL development and maintenance.
- **Data Protection:** Handle all data used in AI tools with utmost confidentiality and ensure compliance with data privacy policies. Ensure all AI tools and

processes comply with data privacy regulations and protect sensitive information.

8.2 Publishing to the Credential Registry

Scope: This policy applies to all Credential Engine internal staff members, external staff, contractors, collaborators, and partners using AI tools for publishing data to the Credential Registry. There are many potential applications, including but not limited to:

- **Utilizing AI-Assisted Methods to Prepare and Publish Data:**
 - Extracting data verbatim and processing the extract to output CTDL data structures
 - Using pre-defined bulk upload templates
 - Implementing CTDL JSON-LD structures
- **Utilizing AI to Derive Data from Other Sources:**
 - Deriving competencies from documents, websites, databases, etc.
 - Automating data collection and integration
 - Integrating data from diverse sources
 - Regular updates and maintenance of data integrity

Credential Engine provides an AI-publishing assistant tool and expects this tool to evolve, potentially integrating other AI tools to expedite and scale the Credential Registry publishing process. Customers will also develop and use AI tools for converting information into CTDL linked open data structures to be published to the Credential Registry. These tools may:

- Generate CTDL data from verbatim content.
- Derive CTDL data from various data sources rather than using verbatim content.

Regardless of the AI tool and process used, all Credential Registry publishing requires an approved Credential Registry account and must utilize one of the Credential Registry system publishing options, including the Registry Publishing Assistant API and any of the system's tools as outlined in the [Credential Registry Guidance Site](#) and per the [Credential Registry Minimum Data Policy](#).

- **Usage:** Employ AI tools to prepare and publish data to the Credential Registry, including metadata extraction and utilizing any of the Credential Registry publishing system options.
- **Review:** Ensure all AI-assisted publishing outputs are reviewed by data managers before final publication to maintain accuracy and reliability. Review AI-assisted outputs for accuracy and compliance with Credential Registry

standards before publishing. Conduct periodic reviews of AI tool outputs to ensure they meet Credential Engine's quality standards.

- **Disclosure:** Notify Credential Engine when AI tools are used to assist in publishing their data to the Credential Registry. Notify Credential Engine when AI tools are used to assist in publishing their data to the Credential Registry. Notify the Data Owner when Credential Engine's AI tools are used to assist in publishing their data to the Credential Registry.
- **Validation:** Implement a review process for AI-generated metadata to ensure it meets the standards and requirements of the Credential Registry. Validate AI-generated metadata to ensure it adheres to Credential Registry requirements. Conduct regular audits of AI-generated metadata to maintain high standards of performance.
- **Approval:** Indicate approval of the data collected prior to publishing to the Credential Registry. Where and as appropriate, obtain approval from data owners before publishing AI-assisted data. Ensure data owner approval is obtained before finalizing the publication of AI-assisted data.
- **Compliance:** Ensure AI-generated metadata adheres to Credential Engine's standards and best practices for data publishing. Follow Credential Engine's standards and best practices for data publishing. Establish and enforce standards and best practices for AI-assisted data publishing.
- **Data Protection:** Handle all data used in AI tools for publishing with utmost confidentiality and ensure compliance with data privacy policies. Protect all data used in AI tools, ensuring compliance with data privacy and confidentiality policies. Ensure all AI tools and processes comply with data privacy regulations and protect sensitive information.

8.3 Using CTDL and Registry Data for AI Training or AI-Powered Products

Scope: This policy applies to all Credential Engine internal staff members, external staff, contractors, collaborators, and customers using AI tools to train models and develop AI-powered products based on Credential Registry data.

Regardless of the AI tool and process used, all Credential Registry data consuming requires an approved Credential Registry Account and must utilize one of the Credential Registry system's consuming options as discussed with the [Credential Registry Handbook](#).

Customers may use CTDL and Registry data for various purposes, including but not limited to:

- **AI Training:** Utilizing data to train AI models for creating vector datastores, building education and career pathways, determining transfer values, and more.
- **Data Analytics and Insights:** Generating insights and reports from CTDL data, identifying trends and patterns in credentialing and workforce data.
- **User Feedback and Improvement:** Incorporating user feedback to enhance AI tools and outputs.
- **Usage:** Leverage AI tools to train models and develop products based on Credential Registry data, ensuring the integrity and relevance of the information.
- **Review:** Regularly review AI models and products to ensure they meet quality and accuracy standards. Perform periodic reviews of AI models and products to ensure they meet Credential Engine's quality standards.
- **Disclosure:** Inform Credential Engine when AI tools are used to develop products or train models using Credential Registry data. Inform stakeholders when Credential Engine's AI tools are used to develop products or train models using Credential Registry data.
- **Validation:** Conduct thorough testing and validation of AI-trained models to ensure they provide reliable and accurate outputs. Regularly audit AI-trained models to ensure they meet Credential Engine's quality standards.
- **Compliance:** Ensure AI products and models adhere to Credential Engine's standards and best practices. Establish and enforce standards and best practices for AI-assisted model training and product development.
- **Data Protection:** Handle all Credential Registry data used in AI training with utmost confidentiality and ensure compliance with data privacy policies. Ensure all AI tools and processes comply with data privacy regulations and protect sensitive information.

