Resultant

Improve Services.
Empower Residents.

WHAT HAPPENS WHEN YOU BRING TOGETHER AI AND SLDS?

States now have enormous opportunities to capitalize on the increasing power of artificial intelligence and machine learning in tandem with continuously expanding State Longitudinal Data Systems (SLDS).[1] In most states, SLDS are used to track employment and wage outcomes against an individual's education and training experiences. These systems primarily integrate educational and workforce data to monitor program and policy outcomes for public sector stakeholders. Currently, 49 states have an active SLDS, with 34 states creating connections among secondary, postsecondary, and workforce data.[2] Many states have also integrated data from public health, social services, criminal justice, and other agencies.

When combined with AI, robust SLDS systems can generate incredible insights for individual users. SLDS systems contain a wealth of data that can be used to train AI-driven models to make personalized recommendations based on outcome metrics of similar personas. These recommendation engines, when developed properly, can bring new SLDS-driven insights directly to state residents to connect them with not just job and training opportunities but healthcare options, social services, early education providers, and much more.

While standard use cases provide extremely valuable insights, states can harness SLDS data to improve customer-facing programs and services. Now is an ideal time for many states to expand their thinking about SLDS and how these systems can directly benefit residents.

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MAKING SLDS AND AI WORK FOR YOUR STATE—AND YOUR WORKFORCE

SLDS opportunities will be different for each state, driven by data robustness, system linkages, and state-specific prioritization but can go a long way toward improving public services and information sharing. Some potential SLDS applications include:

Early Education

- Parent early learning program exploration and evaluation
- Equity analysis for administrators and parents
- Kindergarten readiness evaluations
- Provider resource and staff allocation decision support
- Central location for families to access available services (e.g. Head Start, child care, IDEA Part B/C, home visiting, mental health, nutrition assistance, etc.)

K-12 Education

- Student career exploration and planning
- Digital wallets, certifications, and transcripts for students
- Parent academic progress tracking/evaluation
- Supplemental, personalized learning opportunies
- CTE provider and course offering evaluation
- Equity analysis for administrators and parents
- Assessment use and value analysis

Postsecondary Education

- Student career exploration and planning
- Student digital wallets, certifications, and transcripts
- Student financial aid eligibility and application streamlining
- Personalized institution evaluation and comparison tool
- Equity analysis for administrators and parents
- Institution recruitment and retention analysis and strategy

Workforce

- Equity analysis for program clients and training providers
- Personalized career navigation and job recommendation
- Employer-offered upskilling and training program insight
- Employer strategic hiring and recruitment
- Employer site selection and expansion
- Worker education and training decision support and ROI analysis

Other Public Services and Programs

- Correctional training program and provider evaluation
- Career navigation, skill development, and program selection for incarcerated individuals
- Child welfare case management
- Public benefit case management and service support
- TANF family service support
- Veteran program and service support

REALIZING POTENTIAL: HOW RECOMMENDATION ENGINES CAN TRANSFORM WORKFORCE SERVICES

Our recommendation engine integrates SLDS data and artificial intelligence to generate personalized career and training recommendations for job seekers, helping unemployed residents make informed and personalized career decisions based on the individual's work history, educational attainment level, and career goals. Leveraging the breadth and volume of state government data enables the tool to operate on a level no other tools have reached, providing users with insight into where they fit according to other job seekers with similar knowledge, skills, abilities, experiences, backgrounds, education, credentials, locations, and so on. This new tool can help states get greater ROI from workforce dollars by helping claimants and the state pursue the following core objectives:

— Centralize workforce programs and services by leveraging **longitudinal data and artificial intelligence** technologies to connect unemployment insurance (UI) claimants to workforce resources and programs.

— Recommend **individualized occupational training and career paths** based on real-time, real-world data insights from similar individuals who've had positive workforce outcomes.

— Combine **employer demand/opportunities with customized avenues** for consideration.

— Encourage UI claimants to pursue careers that provide **employment stability, upward mobility, and fulfillment.**

Simplifying Career Navigation for Job-Seekers

UI claimants receive individually tailored, real-time career insights customized according to relevant factors. Most states deploy multiple disconnected tools and services to support job search, labor market research, education and training exploration, and career exploration, which leads to confusion and diminishes outcomes for end users. The recommendation engine is built to enable platforms the state already operates to surface recommendations. Unlike other job search platforms that require endless decision points and filtering requirements, this tool proactively communicates and connects users to personally aligned occupations, education and training opportunities, and a variety of workforce programs and services.

Resultant partnered with state agencies to draw together a breadth of data and better provide personalized recommendations for occupational training and job openings based on applying AI to

- Individual data: Resident-provided information and preferences
- State agency data: Comparative data from workforce, education, and other agencies
- Labor market data: Third-party workforce datasets
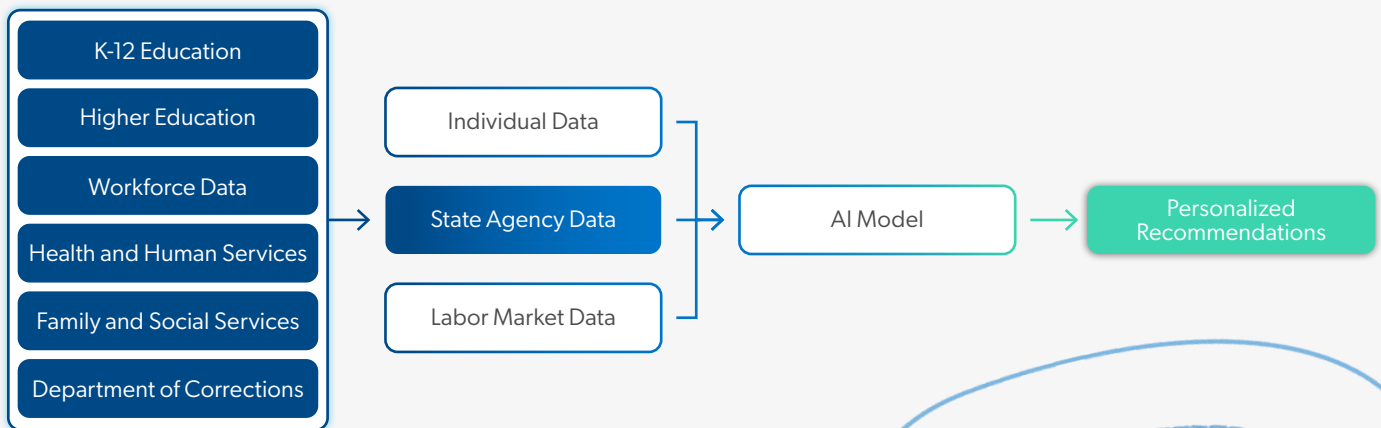
The current version of the recommendation engine tool is tailored for UI claimants and integrated in the state's UI claimant portal. By leveraging individual, state agency, and labor market data, Resultant created an AI-driven algorithm to customize occupation and training recommendations. Goals for the current integration include driving more claimants to pursue increased educational attainment, providing more effective claimant job matching, and ultimately reducing the amount of time claimants spend unemployed.

Data Leveraged from State Agencies

The recommendation engine integrates multiple datasets sourced from a variety of state agencies. These datasets include K-12 data from the education agency; higher education data from the postsecondary agency; and employment history, training, and wage record data from the workforce agency. This data is routed through the state's central data hub, which enables data collection, analysis, and sharing across state government. The central data hub brings the data together by matching multiple records in different state agency datasets to an identifiable individual. This record matching enables the central data hub to trace education, training, and employment outcomes at the individual level. Ultimately, this longitudinal data is used to train the artificial intelligence machine learning model and generate better recommendations for users.

Artificial Intelligence for Personalized Recommendations

A recommender system is a class of machine learning that uses data to help predict, filter, and find what an individual is looking for among an exponentially growing number of options. Recommender systems can generate recommendations based on user similarities or preferences expressed by the user. This project utilizes a hybrid filtering model; recommendations are based on both user similarities and the user's individual preferences.

USER SIMILARITIES

The recommendation engine uses data from the UI claimant's profile to find similar profile records in the central data hub's longitudinal database and generate education/training recommendations that lead to wage employment and career growth. When filing for UI through the state's workforce agency, each claimant is required to provide information concerning the claimant's occupation history, work experience, industry experience, education, training, and geography. The recommendation algorithm uses this information to create the UI claimant's profile. Because the state's UI filing process required claimants to report this information long before WRE development began, no additional reporting burdens had to be integrated within the UI process.

The AI algorithm developed by Resultant uses UI claimant profile data to match similar profiles in the data hub's longitudinal database. UI claimant and longitudinal data profiles are matches based on education, training, occupation, industry, and other similarities. From the similar profiles in the data hub's longitudinal dataset, the AI algorithm brings forward profiles with successful employment and wage growth histories to generate a preliminary set of job recommendations for the UI claimant.

INDIVIDUAL PREFERENCES

Claimant-provided preferences and feedback on generated recommendations can also influence which recommendations are received. The AI-driven model is continuously refined by user feedback on recommended occupations. Claimants are asked to rate the job and training recommendations and respond to a follow-up question about the rating they provide. These responses will improve the algorithm with job recommendations and align to the individual user's background and preferences with greater precision over time and provide the workforce agency with critical data insights that enable the agency to understand why an individual does not prefer their recommendations. This data can be used in various ways; one example is to better understand the talent pipeline of individuals on UI.

RANKED CAREER GROWTH RECOMMENDATIONS

Job recommendations and associated training are ranked and detailed to ensure recommendations are easy to understand and navigate. Users can sort based on median wage, training duration, or number of job openings. Along with each ranked occupation for which training is needed, claimants can review a ranked-order list of training opportunities.

Rankings are informed by third-party labor market data and include recent job postings within the region, projected change in available jobs in the region, and median wage based on location, experience, and education.

UNLOCKING MORE BENEFITS: WAYS TO MAXIMIZE DATA-DRIVEN SOLUTIONS ACROSS YOUR STATE

The tool has been built to be portable and scalable. With continued use and refinement, the algorithm will improve over time. It can be further improved by pulling in additional state agencies and third-party datasets.

[1] AI and/or machine learning can be defined as the concept of machines that can mimic human behavior or perform tasks that usually require human intelligence. Machine learning, which is a subset of AI, is the development of models and algorithms that enable machines to learn from data and make predictions or decisions to improve decision making over time.

[2] RTI International. Learning from States' Student Level Data Systems (SLDS). https://www.rti.org/insights/learning-from-states-student-level-data-systems

ABOUT RESULTANT

Our team believes solutions are more valuable, transformative, and meaningful when reached together. Through outcomes built on solutions rooted in data analytics, technology, and digital transformations, Resultant serves as a true partner by solving problems with our clients, rather than for them.