




# Link, Learn, Lead:

**A Framework for Building Public-Private  
Education-to-Work Data Partnerships**



# Introduction



[Millions of Americans](#) do not have a quality job and face barriers to economic success, particularly people without a four-year degree, people of color, women, and people with criminal records. To understand how and where people are situated in the U.S. labor market and how they experience our education and workforce systems, we need sophisticated data and data systems to illuminate trajectories across the arcs of learning and work. A great deal of public and private data exists that could help map these trajectories and opportunities for intervention. But these data and data systems are not connected or clear. At the same time, with the rapid growth in data products and tools as well as artificial intelligence (AI) technology, we now have an opportunity to link data systems more effectively. This paper makes the case for how and why education and workforce leaders should link public and private education and workforce data to promote economic mobility for all—and provides guidance on how to forge partnerships that will allow us to do so.

A photograph showing several hands of different skin tones placing white puzzle pieces onto a wooden surface. The puzzle pieces are interlocking, and the hands are positioned around a central cluster of pieces, suggesting a collaborative effort to complete a picture.

# Background

There are a number of convergent events and trends radically reshaping public postsecondary education and workforce data systems today. These include:

- Changing technologies, especially the widespread adoption of AI, which have left some legacy systems behind and put [pressure on state systems to modernize](#).<sup>1</sup>
- The emergence of more powerful ways to capture and analyze individual data and to build richer, more complicated pictures of individual consumers.
- The [decline in trust of major U.S. institutions](#), many of which have historically been responsible for collecting and sharing the data we use to understand our economy and people.<sup>2</sup>
- Increases in [interconnected data flows](#) and the need to share data versus growing [concerns about data privacy](#).<sup>3</sup>
- Growth in [personal data collected by companies](#), which has contributed to a [massive increase in data collection](#) worldwide.<sup>4</sup>

Exacerbating and complicating these trends have been significant recent shifts within the U.S. educational and workforce development markets, driven by changes in federal and state political priorities. These include:

- Political pressure to de-center race and gender in education data collection, both via [federal guidance](#) and [challenges to state diversity, equity, and inclusion efforts](#).<sup>5</sup>
- [Federal workforce reductions](#), particularly at the U.S. Department of Labor, U.S. Department of Education, and U.S. Census Bureau, affecting data collection and reporting.<sup>6</sup>
- Downstream impacts from the [reduction in federal grant dollars to nonprofit and education institutions](#), especially with respect to labor market and education research.<sup>7</sup>

More broadly, the data changes facing postsecondary education and training (that is, public and private colleges, universities, and technical training providers) are embedded within a broader series of challenges experienced by institutional leadership,



including funding cuts, diminished public trust, and political conflict. We don't yet fully know all the repercussions of these disruptions. Cuts to the federal workforce and data capacity, for example, may take years to play out.

The broader structural shifts within the data ecosystem and economy—for example, ubiquitous personal data collection and data flow, the mainstreaming of AI and other powerful technologies, changes to jobseeker consumer demand, the emergence of the skills-based economy, and significant changes to how and why people derive trust in education—drive the potential to revolutionize postsecondary workforce systems. Most fundamentally, we now have the potential to link and analyze ever-expanding troves of data in ways previously unimaginable, allowing us to bridge the education and training sectors with the private sector. As a result, we can paint a much richer picture of how different populations experience (or don't experience) economic mobility and better link human capital development with employer demand to drive economic advancement.

This paper focuses on this opportunity by exploring several emergent and critical questions:

- How can linked public-private data and data partnerships change the way we deliver education and prepare learners and workers for the future of work?
- How can linked data help us better understand the mobility trajectories of learners and workers in the United States,

particularly populations facing barriers to economic advancement? And how can linked data create greater economic mobility for these populations?

- What types of data opportunities should we be exploring?

Throughout, we make the case for linking data, provide frameworks highlighting the types of data available, and explore what might be the result of linking that data.

In this paper, we have intentionally kept our focus high-level; this is not a technical “how to” paper, nor is it an in-depth exploration of the barriers that stand in the way. Our hope is that education and workforce leaders can use this paper to better understand the opportunities presented by connecting public records to the private sector and begin the process of forming partnerships for further experimentation. We see the paper as a starting point for dialogue and action with partners across the learn and work ecosystem.



# The Opportunity

**Public sector data**—which we define very broadly as publicly available data on education, the workforce, and the economy—is powerful. It informs postsecondary institutions as they align educational programming to the needs of employers and to measure the short-term impact of those programs for millions of students every year. Employers also use this data to better understand labor market trends, identify talent pipelines, and align their recruitment strategies with regional education and training programs. But we have mostly exhausted the utility of publicly available data to transform education and training. The fracturing of the U.S. political structure has made it extremely hard to build the kind of consensus needed to create the necessary policy change and unlock funding to support widescale

transformation. And decades of work improving and analyzing public sector data have already unlocked much of the most readily available content. This isn't to say that public data has no more to offer—plenty of promising work is underway to bridge disconnected records and unlock protected data. But we recognize that this work would require policymakers to prioritize significant financial investments to update legacy data systems, dedicating dollars to building technical data capabilities among public sector personnel. It would also require total reinvention of the underlying governance that determines how public data is collected, stored, and shared. Given myriad higher priorities for dwindling funds, it is unlikely the necessary investments will be made in state and federal systems through public dollars alone.

## The Limits of Public Education and Economic Data

While public data is a powerful tool, it also has limitations, including rigid or politically influenced methodological approaches, narrow scopes, time lags, resource scarcity, and the fact that much of workforce and education research is macro level and lacks local specificity. Data collection practice in the education sector is heavily influenced by accountability requirements, which do not always include labor market and longitudinal outcomes. Public data is often siloed as well, suffering from inconsistent data definitions and competing priorities. Acknowledging these limitations is important, while also recognizing that public-private data partnerships may have the ability to overcome them.

**Private sector employment data**, which includes detailed analysis of companies' workforce needs, productivity, and other outcomes, and strategic planning, is a promising body of information to deepen our understanding of career pathways. Sophisticated platforms now allow for detailed tracking of hiring efforts, upskilling and skill development investments, internal career pathways, and worker productivity, all linked to business performance metrics and strategic planning data. Massive amounts of private data are collected on virtually every worker in the United States every day—much of it historically isolated from public use, locked behind expensive paywalls and managed through proprietary “black box” methods.

The two systems—public and private education and workforce data and business performance data—are almost completely disconnected. Bridging this divide through [linked data](#)—whereby distinct records are connected with respect to a shared person, place, or event—presents an enormous opportunity to connect supply and demand by aligning workers' and jobseekers' education, work, and skills history with the real-time and projected needs of employers. Linked data also allows for employers<sup>8</sup> to provide direct feedback to educators. It even has the potential to go beyond *what* happens to learners and workers in the labor market and explore *why* they do or do not succeed in the labor market. And, most importantly, private data augments—rather than replaces—public data, catalyzing insights more powerful than either data set alone.

### Linking Public and Private Education and Work Data: An Opportunity to Solve a Historically Pervasive Challenge

Connecting public and private education and employment data allows for **a much richer and more detailed snapshot of the workforce**, which reveals who advances and how effectively, and may even allow for exploration of *why* movement does or does not happen.

Tracking data beyond the education and training institution and over the course of a career enables more robust **longitudinal analysis**, which could incorporate ongoing or stacked skills development, career progression, wage advancement, and career disruptions.

Integrated data opens up **new avenues of research inquiry** that have been previously under-explored, including topics like social capital, the role of worker choice, return on investment to educational programming and skill development, and factors shaping career progression.

As data partnerships mature and policy environments better support data exchange, **new products and even new markets are unlocked**—for example, career navigation tools personalized to the individual or job matching tools that connect detailed employer needs directly to jobseekers and offer incentives for those connections.

## The Challenge with Linking Data

Data interoperability (or, more specifically, semantic interoperability) refers to the process of ensuring that the *meaning* of each piece of data is the same across different data systems. Often referred to as the “apples to apples” problem, the challenge with data interoperability is that many systems have different meanings for the same metric or data term, and many systems don’t have a definition for their metrics at all, so two seemingly alike or identical metrics can, in fact, mean very different things. One approach to addressing this is through data standardization—offering incentives for different systems to adopt identical meanings—but this process can be slow and expensive. Another, perhaps more promising approach is employing AI tools that use generative AI or large data set analysis to create crosswalks between similar but still different metrics. This method allows broad, rich data sets to create functional linkages, in much the same way ChatGPT, for example, converts text inquiries (with all the nonspecifics and semantics of spoken language) into useful research findings. Using this approach, AI may even eliminate skills taxonomies entirely or make major improvements to existing ones. have the ability to overcome them.

We acknowledge that there are ample barriers to building linkages, including data privacy and legal concerns, technical interoperability challenges, information scarcity, and costs. These challenges have obstructed research- and data-informed strategic decision-making many times in the past, and they are in some ways amplified by structural barriers within the education-to-work ecosystem.

But we also believe many of these barriers can be overcome. Privacy rules can be clarified and changed while continuing to protect individual data. Private investors and entrepreneurs will be attracted through new partnerships, use cases, and business models. Technical challenges are, in many cases, just a matter of committing the right resources, time, and creative people. These changes can be facilitated through collective action, including data collaboratives, political advocacy organizations, and investment funds.

# Private Sector Employment and Workforce Data



When we refer to **private sector employment data**, we are focused on private organizations and the data they collect and analyze to better understand their workforce needs (both with respect to future planning and current state). Our definitional approach is quite expansive—we attempt to cover any and all data collection efforts that could produce new insights into the U.S. workforce—and there are some levels of overlap between many of these categories. Below, we summarize each “bucket” of private data in a table, categorized as follows:

- **Hiring data:** Collected by employers and third parties to find, attract, and hire new employees.
- **Personal records:** Individually specific data on non-work criteria, which can have an impact on career choice, performance, and pathway.
- **Customer data:** Information collected on marketing, sales, and customer satisfaction records.
- **Labor market intelligence data:** Geographically and sector-sortable information on labor market demand (and sometimes supply), either pulled from public data or using additional private data.
- **Internal workforce data:** Collected by companies to better understand the needs and performance of their workers.
- **Internal training data:** Learning management systems and related data used to track upskilling efforts and the impact on business operations.
- **Business performance data:** Analysis and planning done by companies to evaluate overall performance (return on investment, or ROI) and risk assessment and to inform strategic planning.



A BRIEF FRAMEWORK SUMMARIZING PRIVATE SECTOR WORKFORCE AND BUSINESS PLANNING DATA.

	Data Type	What It's Used For	Sample Data Fields and Categories
HIRING	Applicant tracking systems	Software tools that companies use to manage the whole recruitment and hiring process, focused on job posting and distribution, candidate sourcing and application review, resume sorting, skills plus experience plus credentialing sorting, candidate evaluation and interviews, candidate communication, and onboarding.	Personal data, resume/CV, application requirements, candidate profiles, job description, job postings data, application status, communication records, time to hire, source of hire, cost per hire, and data privacy records.
PERSONAL RECORDS	Individual finance data	Records on individual financial transactions, wealth accumulation, and debt. Can include income, expenses, account balances, investments, credit history, unreported/informal income, savings, wages/wage growth, and grant eligibility.	Bank account records, income records (for example, paystubs, W-2s), financial transaction data (for example, credit cards), investment data, credit history data, property records, liability statements, budgeting records (aspiration versus reality?), tax records, and insurance records.
CUSTOMER	Marketing data	Customer data—both personal and institutional—with a focus on understanding consumer needs and tracking the success of sales efforts.	Firmographic, technographic, demographic, chronographic, intent data, engagement data, and sales data.

A BRIEF FRAMEWORK SUMMARIZING PRIVATE SECTOR WORKFORCE AND BUSINESS PLANNING DATA.

	Data Type	What It's Used For	Sample Data Fields and Categories
LABOR MARKET	Labor market data	Projections for and measurements of aggregate job demand and supply, hiring/firing trends, skills, demographics, earnings, and hours at a national, regional, and local level. These can also include proxy indicators for economic health, like income/savings to debt ratio, purchasing behavior, economic sentiment, housing data, shipping data, and so on.	Job posting rates, job posting by industry, skills data, wage data, household debt, spending by merchant category, discretionary purchase frequency or volume, new customer acquisition rate, changes in company revenue, shipping volume, transportation data, construction activity, and consumer sentiment, etc.
WORKFORCE	Workforce management platforms	Comprehensive software solutions to help organizations manage their employees effectively by streamlining and automating various processes related to workforce planning, scheduling, time and attendance, and more.	Labor/skills forecasting, budget and resource allocation, schedules, time off, absences and leaves, employee productivity, feedback, coaching, and labor regulations compliance.
	Performance management systems	Performance management (often in concert with workforce management) focuses on goal setting, performance review and feedback, and performance improvement for employees.	Goal setting, performance reviews, performance tracking key performance indicators (KPIs), feedback, performance rewards/flags (including performance improvement plans), advancement data, and termination data.

A BRIEF FRAMEWORK SUMMARIZING PRIVATE SECTOR WORKFORCE AND BUSINESS PLANNING DATA.

	Data Type	What It's Used For	Sample Data Fields and Categories
WORKFORCE	Career advancement systems	Platforms for developing and tracking long-term employment needs, including evolving job descriptions, skills projections, internal career pathways, and criteria for advancement within and across companies or public sector entities. They provide longitudinal frameworks for career pathways and are often closely tied to business planning.	Job descriptions (including trends), skills projections, hiring and performance trends and KPIs, advancement data (both why and who), compensation, talent management, and upskilling or other internal training data.
	Internal learning management systems	Similar to college learning management systems, employer learning management systems are tools for designing, delivering, and measuring the impact of incumbent worker upskilling training efforts. In larger companies, they may be home-grown, but increasingly, these platforms are often provided by third-party training companies.	Skills and course outcomes, learning outcomes especially focused on skill mastery, credentials earned, alignment to job tasks, next-step job descriptions and company workforce needs, and a focus on HR compliance.
BUSINESS	Org-level business performance and planning data	Business impact analyses, forecasting, risk management, aggregate KPIs, continuity planning, and investment data used by companies to understand the health of their business and inform growth and strategic planning.	Financial (revenue trends, fees or one-time costs, sales, debt accumulation, etc), operational (production, supply chain, human capital challenges), and reputational (survey data, online review, media coverage).



# Public Sector Education and Workforce Data

Public sector education and workforce data is often meant as shorthand for the accountability systems data utilized by the state and federal government to measure the operations and impact of postsecondary institutions and workforce programs nationwide, as well as labor market data to measure economic health and employer demand. As with our private sector definition, we take a slightly more expansive view for this paper.

When we refer to the public sector, we are talking about the public institutions that sit at the center of public postsecondary education and workforce funding and the learners and workers they serve. The data we review falls into three broad categories:

- **Macro-data:** Public reporting and analysis by federal agencies on the state of education and the economy—often through the U.S. Departments of Education and Labor—that postsecondary institutions, employers, policymakers, and others use to understand trends shaping the job market and their region.
- **Postsecondary and training reporting:** Mostly made up of reporting or compliance requirements for federal funding, especially through the U.S. Departments of Education and Labor but also including poverty alleviation programs housed in other agencies. This category also includes state reporting requirements and accreditation requirements and third-party data (like college readiness assessments or certification scores) relevant to college reporting.
- **Postsecondary internal data collection:** The operational data that colleges collect to manage and evaluate their effectiveness. This includes a mix of different functions—for example, course design and delivery, student characteristics, program outcomes, business function, etc.—and is sometimes managed through partnerships with private companies that help collect, manage, and analyze data for the college.



A BRIEF FRAMEWORK SUMMARIZING PUBLIC SECTOR EDUCATION, WORKFORCE, ECONOMIC, AND OTHER FEDERAL PROGRAM DATA:

	Data Type	What It's Used For	Sample Data Fields and Categories
LABOR MARKET	Labor market information	Projections for and measurements of job demand and supply, hiring/firing trends, skills, demographics, earnings, and hours at a national, regional, and local level.	Job postings data, Bureau of Labor Statistics and other projections, unemployment records, occupational classification (for example, O*NET), wages and benefits (private and public), demographic data, Census data, payroll surveys, and other economic research findings.
STATE & FEDERAL EDUCATION & WORKFORCE PROGRAMS	Poverty alleviation and workforce training program data	Data collected by major poverty alleviation programs—for example, SNAP Employment & Training, Supplemental Security Income, housing programs, Medicaid/Affordable Care Act, CSBG, etc.—and economic development and workforce training initiatives which include information on recipients, federal investments, and program outcomes. These programs are managed at both the state and federal levels and have reporting requirements that can vary from state to state and program to program.	Recipient demographics, employment status, earned and unearned income, disability status, health records, household status, address/contact info, child support, work history, education history, benefits, and program outcomes (for example, education, work, health and wellness, housing, income, etc).
MARKETING AND ENROLLMENT	Marketing and recruitment data to attract new students	Data collected in the process of planning for, identifying, and attempting to attract new students to the institution. This data includes marketing materials, communication and outreach efforts through digital and traditional platforms, customer engagement metrics, and cost and efficiency data.	Marketing collateral, website, social media and email metrics, lead generation and engagement data, applications, demographic data (often supplied by third-party digital platforms), and budgeting and cost data.

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STUDENT DATA	Student demographic, enrollment, and overall outcome data	Providers utilize data systems to capture and track student background information and progress at the institution. Data collection starts at the point of intake and continues throughout a student's enrollment period, with a focus on demographics, financial aid and billing, program-level academic records, enrollment status, transfer records, student engagement, and credential attainment and completion. The most common acronym used to refer to these platforms is student information systems (SIS).	Intake data, demographics (name, age, race, gender, etc.), income, enrollment status, course registration and attendance, academic performance, time to completion, credit accumulation, disciplinary records, transfer records, housing and meal plans, compliance and reporting data, and completion data.

A BRIEF FRAMEWORK SUMMARIZING PUBLIC SECTOR EDUCATION, WORKFORCE, ECONOMIC, AND OTHER FEDERAL PROGRAM DATA:

	Data Type	What It's Used For	Sample Data Fields and Categories
STUDENT DATA	Course, program, and additional learning data	Postsecondary institutions make wide use of third-party software systems to help build course content and measure student outcomes and experiences in those courses and at the program level. This data is captured primarily via learning management systems (LMS), or learning analytics programs that cut across multiple systems. Canvas, Blackboard, and Google Classroom are common examples.	Course enrollment, time to completion, stop-out rates, intensity of engagement, grades, number of attempts, competency/skill attainment, student content (including discussion platforms), social learning, additional assessments, student belonging and satisfaction, net promoter score, career pathway data, and at-risk or underperformance data.
STUDENT SUPPORT DATA	Nonacademic data collected on student support services	Postsecondary institutions provide extensive support services to students, including tutoring, academic advising, career services, case management, and population-specific supports. Most colleges use dedicated platforms to support these efforts, including software that includes customer relationship management platforms, early alert systems, and academic advising software, or customized versions of more general tools (including spreadsheet software) to keep track of student needs and interventions.	Academic performance, degree progression, credit accumulation, nonacademic barriers (for example, financial needs, housing status, food insecurity, transportation needs, addiction services, etc.), career inventories, resume data, job interview training, job applications, college transfer data, case notes, hiring data, early alert data, intervention efficacy, and student engagement data (including intensity).

A BRIEF FRAMEWORK SUMMARIZING PUBLIC SECTOR EDUCATION, WORKFORCE, ECONOMIC, AND OTHER FEDERAL PROGRAM DATA:

	Data Type	What It's Used For	Sample Data Fields and Categories
INSTITUTIONAL OPERATIONS DATA	Business function data supporting college operations	Postsecondary providers produce and analyze significant amounts of data in support of their business operations. This includes human resources (HR) and staffing, financial operations, facilities and infrastructure, technology, legal and compliance, institutional effectiveness, and strategic planning. At the highest levels, this data is critical for understanding how and why providers invest their limited resources and the costs and return on investment for these decisions.	Staffing data, salaries and benefits, staff recruitment and retention, budgets, tuitions and fees, other revenue (including state and federal investments), expenditures (including program costs), facilities, software licensing, accreditation compliance, strategic planning, internal business performance data, strategic initiative tracking, benchmarking against other institutions, Family Educational Rights and Privacy Act and data privacy compliance, and risk management.
POST-COLLEGE	Post-college student outcomes and alumni engagement data	Many institutions gather data on student outcomes after they complete a degree, credential, or certificate program, especially focused on employment outcomes, and work to build alumni engagement strategies to stay connected with alumni and offer additional training. Data is typically a mix of institutional survey and alumni engagement data, federally reported employment data, third-party employment or certification data, and reenrollment data.	Employment status, occupational title and industry, wage/income, benefits, student satisfaction, employer satisfaction, time to employment, job readiness, additional training required, additional credentials required/obtained, length of employment, career advancement data, skill endorsement or usage, and licensing data.





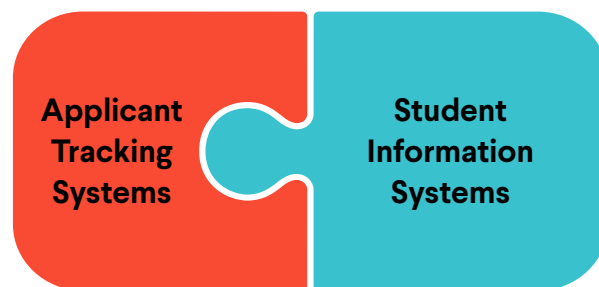
# Putting the Pieces Together

To illustrate the power of public and private data linkages, we have chosen three examples of how public plus private and private plus private data could be combined to develop a deeper understanding of employer demand and the learn-to-earn pipeline.

## EXAMPLE 1:

### **Building a stronger tie between education and post-education employment.**

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Combining employer applicant tracking systems (ATS) data with postsecondary SIS data can establish a bridge that provides much more detailed information about who gets hired and the attributes that may have contributed to their hiring than traditional public employment data. ATS data provides a detailed breakdown of who applies for jobs (resumes and cover letters), who is tagged as a possible candidate, results of interviews and other sorting mechanisms, final selection processes, offer conditions (including wages), and ultimately who is hired (and under what conditions). Companies like Workday, Oracle, and SAP are major platform developers and hold significant data resources related to hiring processes. SIS systems—sometimes also referred to as student management systems (SMS)—are used to track student-centered data at institutions, including recruitment and enrollment data, student performance data, demographics, and communication records.

When combined, the two data records can allow for new insights into *who* is successful in transitioning from college into employment and *how* colleges directly contribute to this process. Some key potential lessons include:

- Where are there disconnects between job postings (what companies *ideally* want in a hire) versus actual hires (what companies are willing to accept in a hire)? What skills and educational content are overemphasized in hiring, and which have less of an impact on hiring rates? And how do people with various background, nonacademic, and other characteristics experience hiring processes differently?
- How do student-institution career advising communication efforts (potentially mined by language-sensitive tools like generative AI) add additional context to student career decision-making and job applications and contribute to overall job search and even career advancement success?
- What college programs and credentials (including nondegree credentials) nationwide lead to higher-than-average hiring rates?
- When combined with learning management systems, where course content and learning outcomes are captured, we can explore additional critical questions, including:
- What are the most common skills gaps, both with respect to unneeded skills, which colleges train for, but which don't appear to be relevant in hiring decisions, and untrained skills, which employers want but are underrepresented in recent graduates? This learning could be fed directly back into postsecondary programming to improve industry alignment.
- What courses or achieved learning objectives contribute most to hiring outcomes?
- What nonacademic but still teachable skills contribute most to hiring? Are there student characteristics or other SIS data patterns that contribute to the signaling of nonacademic skills?

### **If we go deeper and amplify an SIS and ATS linkage with additional linked data, what else might we learn?**

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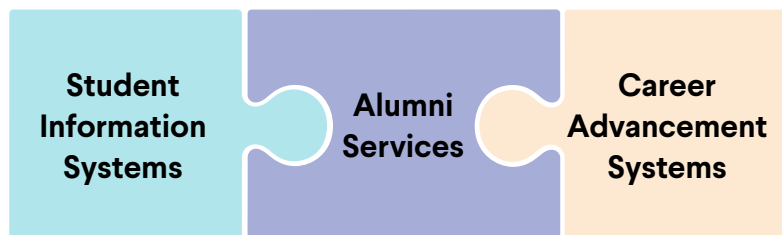
*For example:*

- + **Career services data:** Do students with certain engagement levels with career services or who receive specific career services support (like resume development or interview training) see better outcomes?
- + **College finance data:** Are there college-taught programs, credentials, or skills that lead to better outcomes at lower cost, creating a better return on investment?
- + **Employer workforce management systems:** How do students from different backgrounds and with different learning experiences perform on the job? And what employer support programs help them perform better?

## EXAMPLE 2:

### Connecting educational services to lifelong learning.

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In this example, we combine alumni services data and career advancement systems data with the aforementioned SIS data, resulting in potential linkages between student learning and demographics, ongoing training (including postsecondary continuing education programming) or other alumni services, and career advancement. The result would be one of the only examples we have of lifelong learning—whereby students undergo ongoing training and relationships with educational specialists to advise on career pathway development—to continue along a career pathway. The employment data would be much richer than that provided by resume data or unemployment insurance wage record data, which is primarily how career advancement is limited in measurement today.

When combined, these three data systems would allow for new insights into how postsecondary education and training providers can and do contribute to long-term career advancement, as well as factors that contribute to workers facing career stagnancy. They would also create critical lessons for how providers can be better advocates and support systems for workers once they finish their postsecondary education. Some potential key lessons include:

- How do different colleges, programs, degrees, and various student demographic categories position learners and workers for career advancement?
- What interventions—additional training, new credentials, upskilling, etc.—help unlock advancement, both within companies and between companies (new jobs)?
- Are there industries or occupational pathways that are more likely to lead to advancement and for whom and under what conditions?
- Can alumni services provide critical career guidance and linkages to additional learning to facilitate advancement?
- Can alumni-focused career guidance be used across educational partnerships (especially two-year to four-year colleges and universities) to help support advancement, and how can this support be financed?
- If a postsecondary provider or learning consortium is committed to supporting incumbent workers and reengaging former students to drive advancement, how does their approach need to change relative to more traditional educational models?

## If we go deeper and amplify SIS plus alumni services plus career advancement data with additional linked data, what else might we learn?

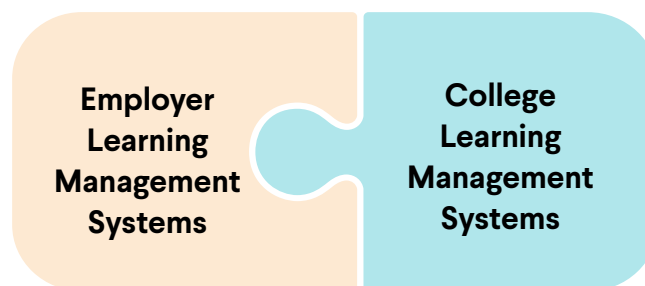
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- + **Performance management systems:** Do students who engage in career support via alumni services and/or who take advantage of additional training see improvements in their performance review scores, bonuses, and other performance indicators?
- + **Learning management systems:** What skills, learning outcomes, credentials, or other course design options (like modality, length, intensity, and synchronicity) contribute most to career advancement gains, and how does this vary by industry/occupation?
- + **Individual financial data:** Do students who engage in additional training or alumni services and who see career advancement also see relative improvements in financial security, and which interventions matter most (including financial literacy training)?

### EXAMPLE 3:

#### Building a learning ecosystem across postsecondary education and work.

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Postsecondary institutions often lag labor market shifts, especially with respect to degree programs that typically require more work to develop and extended periods to approve. But these programs also lag because they tend to react to macrolevel economic data (including federal reporting and jobs posting data) and feedback from regional employers on previous program offerings.

One area to improve labor market responsiveness is to improve the link between the public and private training systems. This makes a lot of sense given that colleges and companies (or third-party vendors that work with companies) *both* provide training, with the difference being colleges are often the first step on an education-supported career pathway, with the private sector providing subsequent steps. And both the public and private sectors use similar learning management platforms to deliver their training.



By linking public-sector LMS systems with private-sector LMS systems, we can bridge the longstanding divide between postsecondary education and the needs of employers and create much richer feedback loops to inform educational design. Some potential key lessons include:

- Real-time data capture of the educational needs of the labor market that can directly inform the learning outcomes, curriculum, and course competencies (if used) of postsecondary programming.
  - The development of demand-driven career pathways based on real linkages between different occupational clusters or titles rather than the less-specific, time-limited, or speculation-based pathways often used by postsecondary institutions today.
  - Better definition of skills and competencies embedded within postsecondary programming to reflect the definitions—including shifting definitions or emerging skills—used by the private sector.
  - Identifying emergent trends—especially around labor market disruptors like AI, automation and other new technologies—to forecast skills shortages and shifts in demand better.
  - Alignment between work-based learning delivery models and educational models to better mimic learning in the workplace and to identify work-based learning skills (for example, how best to learn, not just what to learn).
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- + **Performance management systems:** Do better-aligned training pathways lead to better-performing employees, requiring less training, fewer performance interventions, and more rapid advancement?
  - + **College advising and career services data:** What more detailed, job-specific, and longitudinally reinforced talking points and tools help students understand their learning pathways, and what skills do they need to advance (or, better yet, include real-time wage data to get a better sense of how to negotiate salary)?
  - + **College business and operation data:** Which LMS platforms have the strongest usage among both colleges AND employers (including outcome ROI data)? And how are these platforms offering to align their data across the private and public sectors? How can they help learners better succeed at work, both with respect to core competencies and learning to learn?

## Other “unlocks” that can emerge from linked data (including efforts that may go beyond the traditional purview of postsecondary education systems):

Linked Data Sources	Outcomes
<b>Macroeconomic data + (macro) applicant tracking system data</b>	Among jobseekers, how does their experience looking for work vary across different geographic, demographic, and industry/occupational dimensions?
<b>Workforce management platforms + college business planning and operations data</b>	How can shifting trends within workforce management efforts—particularly to labor force planning, skills needs, and forecasting—inform college strategic planning, especially with programming aligned to employer needs?
<b>Federal or state workforce and poverty alleviation programs data + college student information systems data + applicant tracking data</b>	How do poverty alleviation programs work in the labor market? Which college programs demonstrate the most success for students receiving this funding or how do outcomes differ for students who don’t receive support? How can we make federal funding lead to better outcomes more efficiently?
<b>Federal or state workforce and poverty alleviation programs + college student information systems data + workforce management platform data</b>	How successful are students accessing poverty alleviation funding in their jobs? What additional support or skills (including career navigation and workplace success skills) do they need that aren’t emphasized enough in postsecondary education? How can federal funding support additional student services and skills development?
<b>Business performance and planning data + student recruitment data + college strategic planning data</b>	At a macro level (system, state, and national), how can we better align talent supply strategy (recruiting students, enrollment strategy, and program offerings) with employer growth and talent development strategy, aligned to priority industry sectors? What is learned could help inform national and state economic development and related policy strategies.
<b>Workforce management, learning management systems, and career advancement data + college learning management and student information systems data</b>	Large-scale data sets combining multiple inputs can create much clearer pictures of 1) who advances along a career pathway (and what those pathways look like); 2) what factors appear to contribute to advancement or do not (and therefore require more research to understand); and 3) what teachable skills—including nonacademic skills—are more valuable in creating mobility. The complexity of this analysis would require very narrow parameters to be successful initially.

# How to Start a Data Revolution

This paper challenges education and workforce leaders to engage in the creation of public-private data partnerships to drive better learner outcomes, but most of the paper has so far focused on what we mean by linking public-private data and making the case for what it might accomplish. We want to conclude, however, with a focus on *how* to drive data partnerships.

There are many levers available to education and workforce leaders who wish to pursue stronger education-to-work data connections. These levers do not necessarily require private industry to take the lead, nor are they insurmountably blocked by technical, regulatory, or financial barriers. But they do require leaders to set the vision and to direct their systems and partners to explore new relationships, not least of which will be overcoming resistance based around reluctance to work differently and risk aversion.

Below are some of the levers by which education and workforce leaders can push for change:



## **MARKET FORCES:**

State college systems are major customers of data platforms. Via individual contracts, regional compacts, or coordinating entities like the Coleridge Initiative's Administrative Data Research Facility (ADRF), these systems may be able to negotiate richer data-sharing agreements focused on new metrics or linked data. Likewise, state and federal government agencies often have significant contracts with private corporations across multiple industry sectors, and future contracts could include data sharing agreements focused on bridging labor supply and demand.



## **DATA PACKAGES:**

Many companies, such as Workday, Oracle, and Equifax, provide platforms to *both* the private and public sectors. It's quite possible that under the right circumstances, they could "package" data to include insights from both sides of the market and create data linkages within their own platforms.



## **INNOVATION INVESTMENTS:**

Public and private philanthropic grant programs have played a significant role historically in reducing costs and promoting innovation among state governments and educational institutions, including in the collection and analysis of data. A modern version of this approach might focus on education and workforce systems working with major data companies and corporate partners to build, test, and sustain public-private data partnerships.



### **MAKING THE CASE:**

Much of the slow growth of public-private partnerships built around skills-first practices and the adoption of data wallets (or learning and employment records—LERs) has been because value propositions and ROI evidence have lagged design and implementation efforts. Public-private data partnerships require the same thing. As education and workforce leaders explore new data innovations, keep in mind a critical long-term goal: *How does a linked data model ultimately lead to financial outcomes, either through the creation of innovative new business models or by driving additional revenue or cost savings to corporate partners?*



### **EXPANSION OF DATA POOLS AND OTHER PREEXISTING DATA-SHARING STRUCTURES:**

There are a number of postsecondary data-sharing entities or coordination efforts already in place, including organizations like [National Student Clearinghouse](#) and initiatives like the [T3 Innovation Network](#), and the [Job Data Exchange](#) that have attempted to at least partially bridge the public-private data divide.<sup>9</sup> These efforts need more participation from public sector leaders and systems to improve the attractiveness of their data for the private sector and offer incentives for private sector participation.



### **POLICY:**

One of the major barriers standing in the way of successful public-private data linkages is policy, especially regulations that make data sharing extra expensive or at risk of violating data privacy rules. Some solutions policymakers might explore include:

- Allocate resources to cover one-time technical costs of integrating data systems.
- Explore regulatory simplification to reduce transaction costs.
- Address myths and misinformation about what prevents (or does not prevent) linking records, especially records with personally identifiable information or other protected data.
- Require or provide incentives for interagency or interstate agreements to share data and explore frameworks for private-sector data partnerships as well.
- Develop communications campaigns focused on why and how postsecondary institutions can engage in data partnerships without violating regulations and without undue risk.





# What's Next: Linking Data, Unlocking Opportunity

Despite facing real challenges, the opportunity to link data across sectors is not only possible—it's urgently needed. Linking public and private education and workforce data strategically will allow us to better understand and improve the experiences and outcomes of learners and workers, especially those who face barriers in navigating our education and workforce systems. Without these connections, the people most impacted by fragmented systems remain invisible in the data—and underserved in the solutions.

Jobs for the Future is committed to partnering with other organizations in leading this work. We aim to support and catalyze efforts across the learn-and-work ecosystem, collaborating with others to build a future where linked data informs better decisions, drives more inclusive innovation, and empowers people to achieve their full potential. Below, we offer a set of emerging ideas that illustrate what becomes possible when data systems are connected with purpose. These examples highlight innovations (some already in use, others on the horizon) that show how smarter data linkages and new technologies can help us better support learners, workers, and employers alike.

## Social Media and 'Soft' Signaling

One of the major challenges with jobseekers is that you often can't tell they are jobseekers. For example: A person frustrated with their current job and open to a new position may not be actively looking for something new; "open to work" signals like those used on LinkedIn tend to have stigmas attached, especially for people worried their current employer will notice; or people with strong skill sets for better jobs may not even realize they are a good candidates. One exciting solution is to use AI to analyze social media data to find behavioral patterns that allow for predictive analysis on *prospective* jobseekers. These so-called "soft" signals might include comments about work frustration or the need for a better salary, recent updates to online resume platforms, or skills analyses linked to future occupational pathways. Employers and educators could then personalize recruitment strategies to encourage applications, potentially leading to a much more

efficient and effective system for training and attracting talent. As with all untested or newer data models, especially ones involving AI, it is important to evaluate this approach for bias and what population groups may be underrepresented or misrepresented through social media platforms.

## A New Paradigm for Data Validation

Historically, validating the authenticity of data is a major challenge in the education-to-work ecosystem. Do jobseekers actually possess the skills they list on a resume or include on a transcript, and can they apply them well? Does skill terminology have the same meaning for the jobseeker and the employer? One exciting solution is data inference, where we can use linked data sets to infer findings that aren't directly included in the set. For example, workforce performance data plus career advancement data (including wages) plus learning management data from both postsecondary and employer systems can paint a pretty clear picture of employee advancement and, to a lesser degree, the role training and support play in that advancement. So, too, can the same data indicate whether an employer is supporting workers and advancing them when they are ready (and compared to other companies). Nor is this limited to methodological approaches like inference. There are emerging technologies to verify records in data authentication. A resume that included an Open Badges 3.0 standard, for example, could have a series of verified work records, skill development, credentials, and other critical criteria to validate information self-reported on a resume by the jobseeker. Because these data sets are potentially so large—including millions of people, each with thousands of different data points—AI will be a critical tool for doing skills analysis at scale and to avoid the potential of false conclusions influenced by small sample size or other outlier characteristics.

## Real Student Career Navigation and Advice

Imagine if student career navigation tools were built using verified workforce data and broad student data sets. Career advising could become immensely personalized: What skills do you already have, and what else do you need? How do you build a career, not just a job? How did people with similar demographic characteristics or who share your passions succeed in similar pathways in the past? Are there companies looking for people just like you that haven't found you yet? Pair this with an AI chat interface, and suddenly you have a user-friendly way to deliver this information that can update over the course of a student's entire career. AI tools like ChatGPT have revolutionized access to information so much so that, according to research by the [Harvard Business School](#), the top three uses of generative AI in 2025 are all related to personal exploration and connection.<sup>10</sup> Imagine if AI could help jobseekers create links between the skills they have and the jobs they want and fill in the gaps in the available data. A jobseeker might, for example, be able to go beyond location and salary when searching for jobs and find roles that offer the best benefits or lowest turnover rates, that allow them to live near water, or have the best chance of promotion, all by utilizing user-friendly chat interfaces with near-instantaneous feedback.

## Truly Linking Supply and Demand?

Linking data allows for a key intersection of two crucial ideas related to connecting jobseekers with jobs. First, from the perspective of the jobseeker, is the need to find the “right” job, where a person’s skills are valued, they will be supported in their career advancement goals, and they can see how a job contributes to their long-term goals. They need comparative data that shows that people they can identify with thrive in any given workplace. Second, from the perspective of the employer, is the need to know that a new hire is the “right” person for the job and that they have validated skills and abilities and intangible attributes that will make them a good fit for the team and the company as a whole. The result of a supply-and-demand linked ecosystem could be powerful, leading to new tools for matching workers to the jobs that are right for them, financial incentives for employers to compete for talent (both by focusing on “good” jobs and career advancement and salaries), resources to help jobseekers better understand the value they bring to employers and the right fit, and systems that better support lifelong learning and adaptability. AI has the potential to help identify these linkages, where the data pool is much richer than historical analysis but still needs to allow for macrolevel economic insights, and test and improve the methodology in real time or as new data sources become available.

## Unlocking Lifelong Learning

Lifelong learning—the process of continuous skills development and knowledge acquisition in pursuit of career advancement—is a hot topic among educational entrepreneurs, especially in the LER/skills wallets communities. The challenge, however, is that much of the learning being done is captured in disconnected systems, unverified, hard to access, or documented via informal processes. Linking data across sets and utilizing AI tools to analyze it has the potential to allow for longitudinal analysis and data capture as a person moves throughout their career. Enabling this will require addressing policy and regulatory conditions to support and encourage lifelong learning, as well as making the business case apparent, but could lead to powerful tools for capturing career pathways and empowering workers. Chatbot technology will allow for longitudinal relationships between AI and consumer, enabling a level of personalization over time that may resemble (or augment) classic case manager/advisor relationships with clients.

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