

The Role of Artificial Intelligence in the Evolution of Learning & Development

WHITE PAPER



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Part 1 AI: the disruptive force that will transform L&D

According to Bloomberg, Artificial Intelligence is likely to be the most disruptive force in technology in the coming decade¹, which will be key to the evolution of learning and development in organizations worldwide.

Two of the most important challenges in L&D today are caused by the general lack of valuable metrics and data-driven business insights:

1. Identifying employee skill gaps.
2. Measuring ROI of learning programs.

Many companies still train for skills that don't match their actual needs, because they fail to collect and interpret the right data to identify skill gaps and drive business outcomes.

Artificial Intelligence-powered innovations by companies such as IBM, who can now predict future skill gaps and performance, are leading the way to solve these problems.

By leveraging AI to identify development needs and link learning-related metrics to business outcomes, organizations can create effective, self-optimizing learning programs. AI-powered platforms can make employee-specific predictions and recommendations for skill development, future performance, and collaborative learning experiences by ingesting and analyzing various data sources.

Most industries are already using AI to analyze large amounts of unstructured data to draw business conclusions from, which is an indicator that this is a logical next step for L&D and HR in general.

¹ A new era: Artificial intelligence is now the biggest tech disrupter, Bloomberg 2017

Part 2 Definition of AI and how it predicts the future

In the context of business and technology, the term Artificial Intelligence (AI) is often used as an umbrella term to refer to autonomous machines, software, and algorithms with learning or problem solving capabilities. This includes the ability for computers to understand natural language to communicate with humans, make predictions based on data to drive insights, analyze physical surroundings to drive a vehicle, simulate neural networks of the brain to recognize images or translate text, and so forth.

One important subfield of AI is machine learning. There's no consensus on the exact definition of machine learning, but the following definition on Nvidia's blog² describes the inner workings of machine learning quite well:

“Machine Learning at its most basic is the practice of using algorithms to parse data, learn from it, and then make a determination or prediction about something in the world”

A well-known subset of machine learning is deep learning, a technical concept based on artificial neural networks that makes computers able to learn automatically without introducing hand-coded rules.

Machine learning and deep learning algorithms are widely available and accessible via open source software libraries and cloud computing platforms such as IBM Watson, Amazon Web Services, Google Cloud, and Microsoft Azure. Practically, this means that anyone with the right set of data is able to make AI-powered predictions.

A quote by Ted Sergott, EVP, Product Development at PRO Unlimited and member of the Forbes Technology Council³, summarizes the strength of data-driven AI as:

“One of AI's biggest strengths lies in its ability to sift through millions of unstructured data points and make sense of them quickly.”

In business and HR, platforms like IBM Watson combine deep learning technologies with other AI technologies and complex business-oriented data sets to make predictions on employees and business performance. In fact, IBM Watson can now, with 96% accuracy, infer the potential skills and qualities employees might have to serve IBM in the future by

² What's the Difference Between Artificial Intelligence, Machine Learning, and Deep Learning?, Nvidia Blog 2016

³ Artificial Intelligence And Its Impact On Contingent Workforce Management, Forbes 2018

looking at an employee's experiences and projects⁴. IBM managers take Watson's hypothetical future performance assessment rating into account as they make bonus, pay, and promotion decisions.

Bloomberg writes: "To motivate employees to learn new skills, more employers are starting to focus on the future during evaluations. The shift to skills-based performance management is motivated, in part, by employers that say they're struggling with a skills gap."

Clearly, the potential of AI to help employees develop the right skills and to help employers predict future needs is massive.

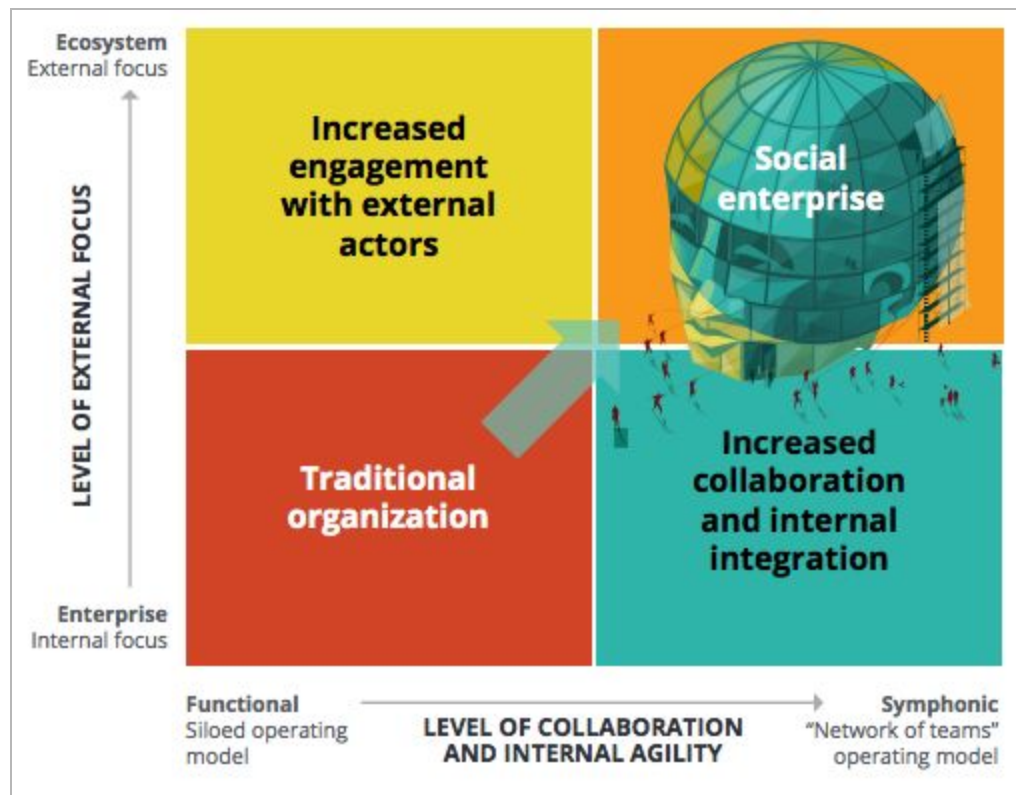
⁴ Your Raise Is Now Based on Next Year's Performance, Bloomberg 2018

Part 3 The problem of identifying skill gaps

Historically, an important reason that training programs haven't yielded the desired results is because they've usually been launched without sufficient knowledge of where the gaps in employee skills exist⁵. Millions of dollars have been invested in learning programs without actually understanding the necessity and impact of these programs. With the rise of the social enterprise, this problem has become even more complex.

Recent research by Deloitte Human Capital Trends, in a report titled *The rise of the social enterprise*, concludes⁶ that in the 21st century, careers are no longer narrowly defined by jobs and skills, but through experiences and learning agility. However, only 37% of the 11,000 business and HR leader respondents believe their organizations are ready for this shift.

Figure 1. The evolution of the social enterprise



Source: [Deloitte Human Capital Trends 2018](#)

⁵ Identifying employee skill gaps, McKinsey & Company 2009

⁶ The rise of the social enterprise, Deloitte Human Capital Trends 2018

In fact, 72% of organizations already have career paths that do not follow traditional organizational hierarchies, while only 53% of organizations develop their people through collaborative learning and experiences needed for the development of talent following these nontraditional career paths.

According to McKinsey & Company⁷, unleashing the power of collective intelligence is critical to the digital-learning transformation. Employees learn through collaboration and can be empowered to share knowledge across the company, a practice that can be used to identify skill gaps and measure performance.

In large global companies, HR or L&D can't own detailed knowledge about the existing and emerging skills a diverse workforce must have to improve the performance of each business. In these organizations, the collective knowledge of all employees can be used to identify existing and emerging skills. This requires the collection and interpretation of data from employees on a large scale.

Consequently, in order to identify skill gaps in the modern workforce, organizations would benefit from a holistic approach to data collection and intelligence.

⁷ Learning at the speed of business, McKinsey & Company 2016

Part 4 Learning-related metrics and business value

The lack of learning-related metrics and difficulty ensuring the continuous improvement of skills are among the most pressing challenges in their skill-building programs, executives report in a survey conducted by McKinsey & Company⁸. Fundamentally, metrics are a prerequisite for building capabilities in a sustainable way. More than half of executives say that their companies link skills employees acquire in learning programs with individual performance, but only 13 percent say their organizations calculate the quantifiable returns on their learning investments.

The four steps of the Kirkpatrick Model (Figure 2), a scientific model for measuring the effectiveness of learning solutions, all require the collection of data to draw conclusions from. An important challenge facing L&D is to be able to make sense of the data and to leverage those insights to drive business value⁹.

Figure 2: Illustration of the Kirkpatrick Model



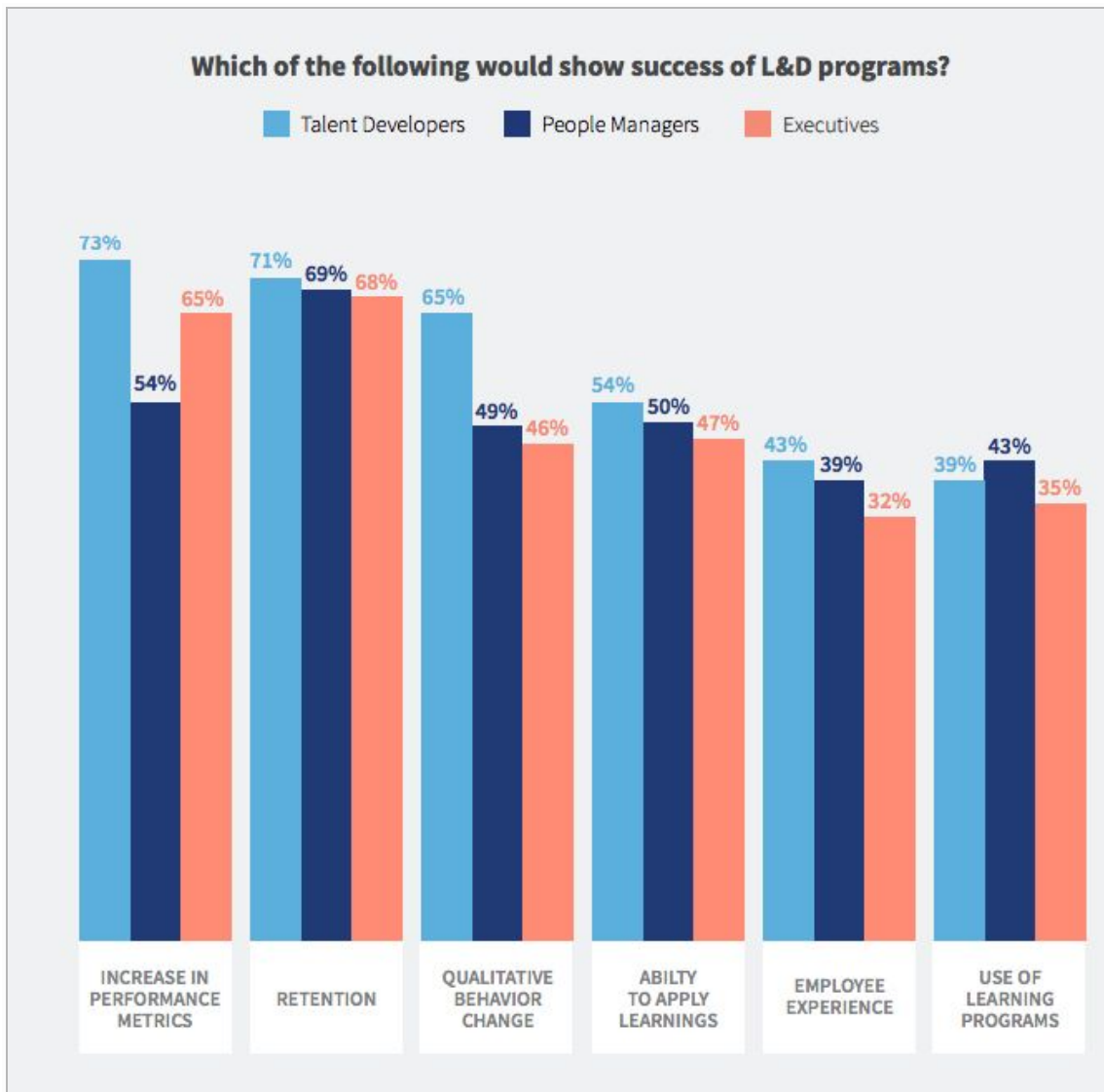
Source: [The Kirkpatrick Partners](#)

Research by LinkedIn Learning indicates that the top three indicators of success of L&D programs, according to talent developers, people managers, and executives, are an increase in performance metrics, retention, and qualitative behavior change (Figure 3).

⁸ Building capabilities for performance, McKinsey & Company 2016

⁹ The Role of AI in Learning and Development, Inc. 2018

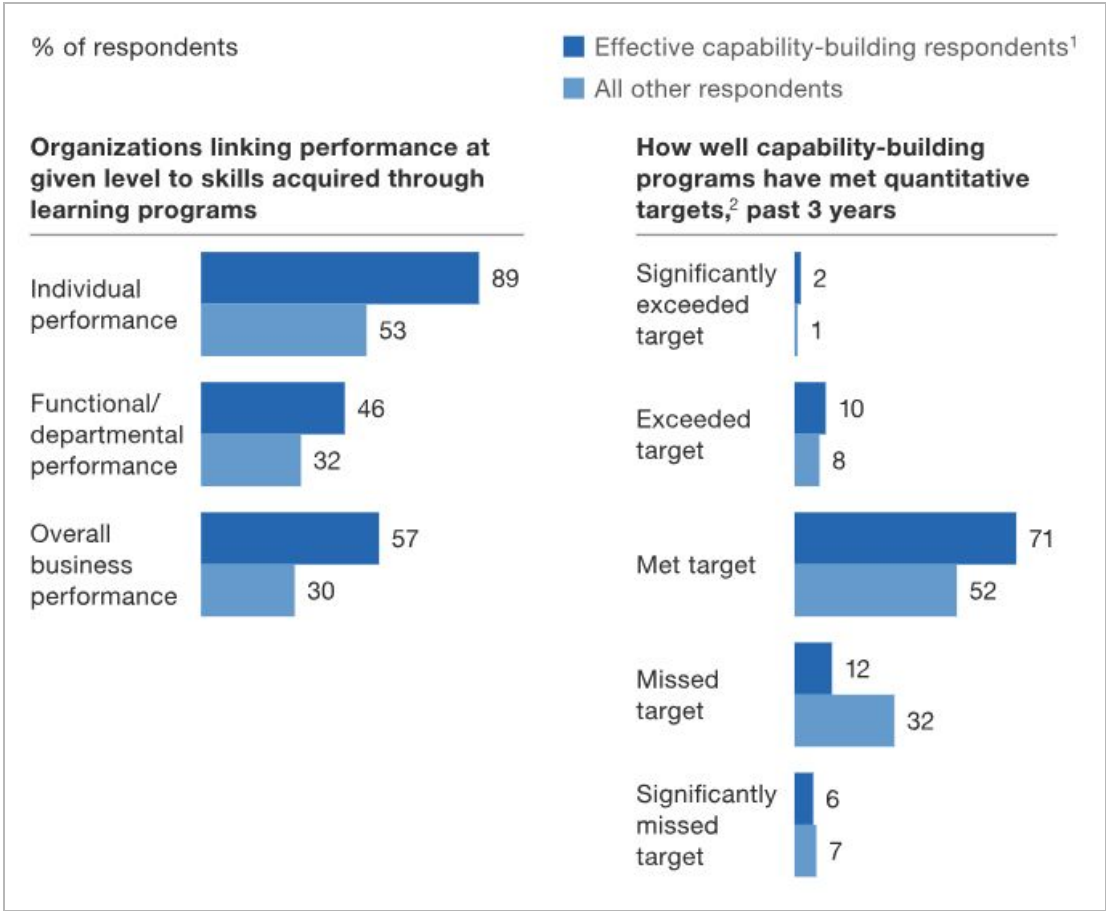
Figure 3: Success indicators of L&D programs



Source: [2018 Workplace Learning Report](#), LinkedIn Learning

Furthermore, McKinsey’s research further shows that companies that build skills most effectively do a better job of linking skills to performance and targets than companies that don’t build skills as effectively (Figure 4).

Figure 4: Companies that build skills most effectively vs. other companies



Source: [Building capabilities for performance](#), McKinsey & Company

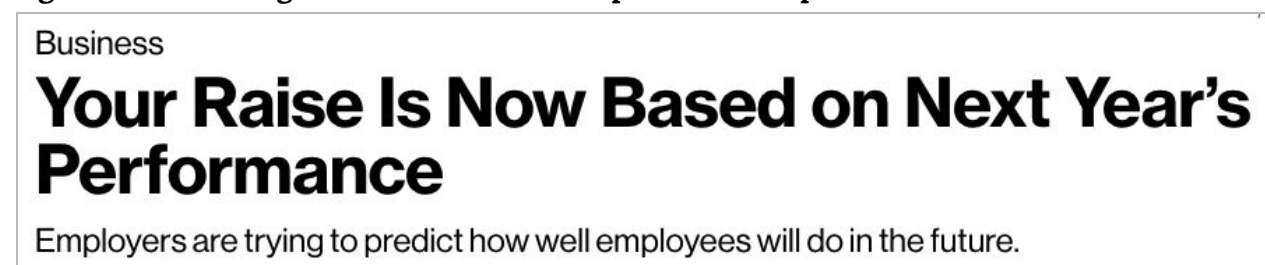
This raises the question: how can organizations effectively measure the effectiveness of learning programs and link these metrics to business performance to understand ROI?

Part 5 Predicting skill gaps and measuring ROI

The challenges of identifying skill gaps and constructing effective composite metrics are closely related. They both require an ongoing loop of data collection, interpretation, and optimization. The question of what skills to develop can be answered by the analysis of people data and business outcomes. Artificial Intelligence can be used to automate this loop and self-optimize the process based on machine learning models.

By analyzing an employee's experiences, projects, and training programs, machine learning models can predict what skills the employee should work on to best serve the company in the future. This is what IBM Watson Analytics is already doing to predict skill development needs and future performance of employees. Watson Analytics is a platform for business analytics and intelligence (BI), which uses predictive machine learning models and cognitive capabilities to draw business conclusions from data.

Figure 5: Bloomberg headline about future performance predictions



Source: [Your Raise Is Now Based on Next Year's Performance](#), Bloomberg

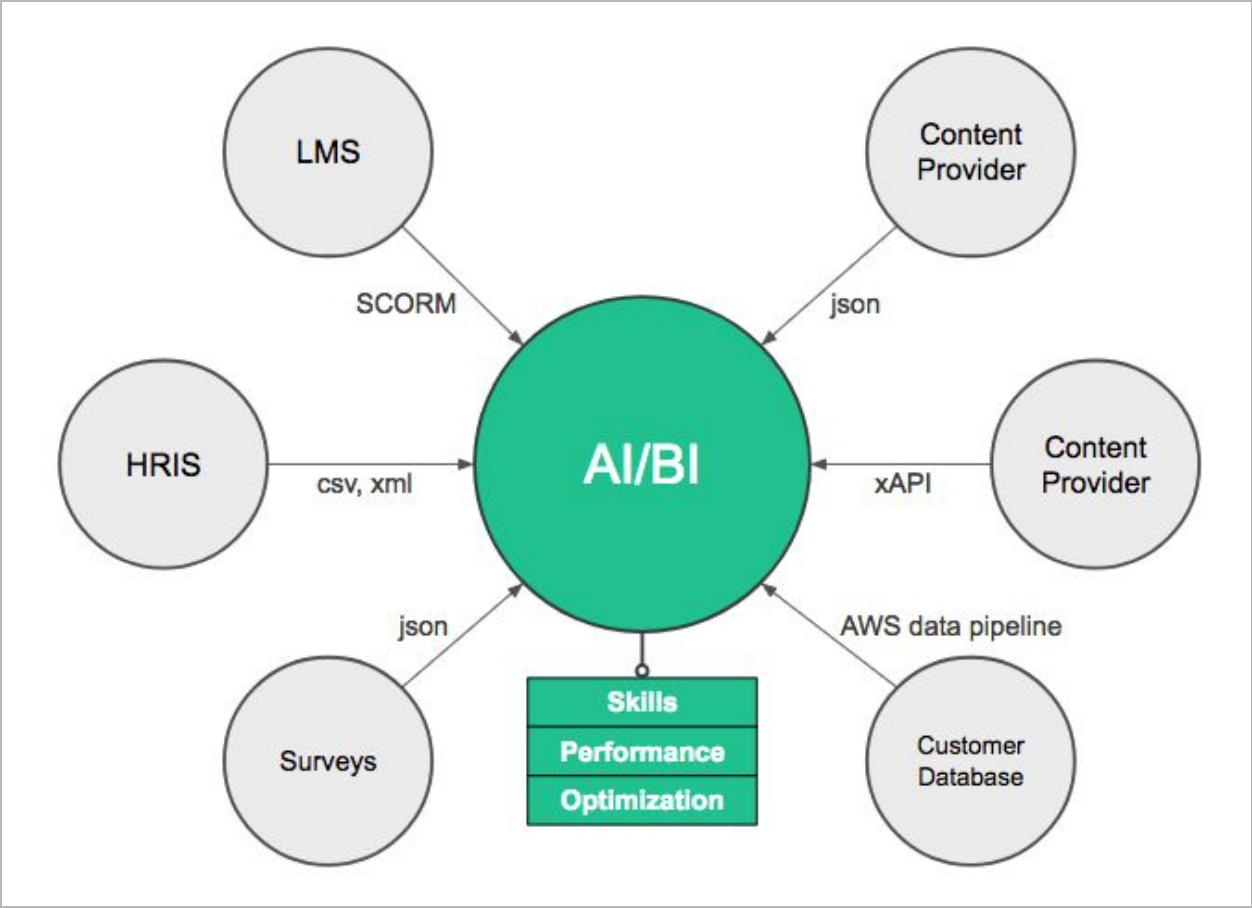
Platforms like Watson can analyze and combine large amounts of structured and unstructured data to draw business insights from. This means that instead of having to feed the platform data in a particular format, the platform can ingest anything like xAPI records, databases, csv files, a stream of events, documents like resumes, surveys, and emails. AI models have been trained to understand all these data inputs, which makes them able to interpret and structure the data automatically.

These AI-driven BI platforms require companies to only provide data pipelines from their existing systems, like HRISs, LXPs, LMSs, and survey tools. From these data pipelines, dashboards showing metrics such as current skill gaps, future skill gaps, ROI, and employee satisfaction can be built. Furthermore, the AI-enhanced data can be pulled back into learning platforms to enhance and optimize learning experiences automatically.

A great benefit of using a business intelligence platform is the ability to involve domain experts and analysts in creating the appropriate dashboards and prediction models.

Instead of having to manually program any dashboards and reports, organizations can use intelligent AI to automatically learn from data, while using non-technical domain experts to convert these learnings into valuable business insights. This is already a common practice in many industries like healthcare, where doctors and analysts work together on building valuable BI dashboards without involving programmers for building these dashboards. Therefore, this seems like a logical next step for HR.

Figure 6: AI-driven predictions by using a centralized business intelligence (BI) platform



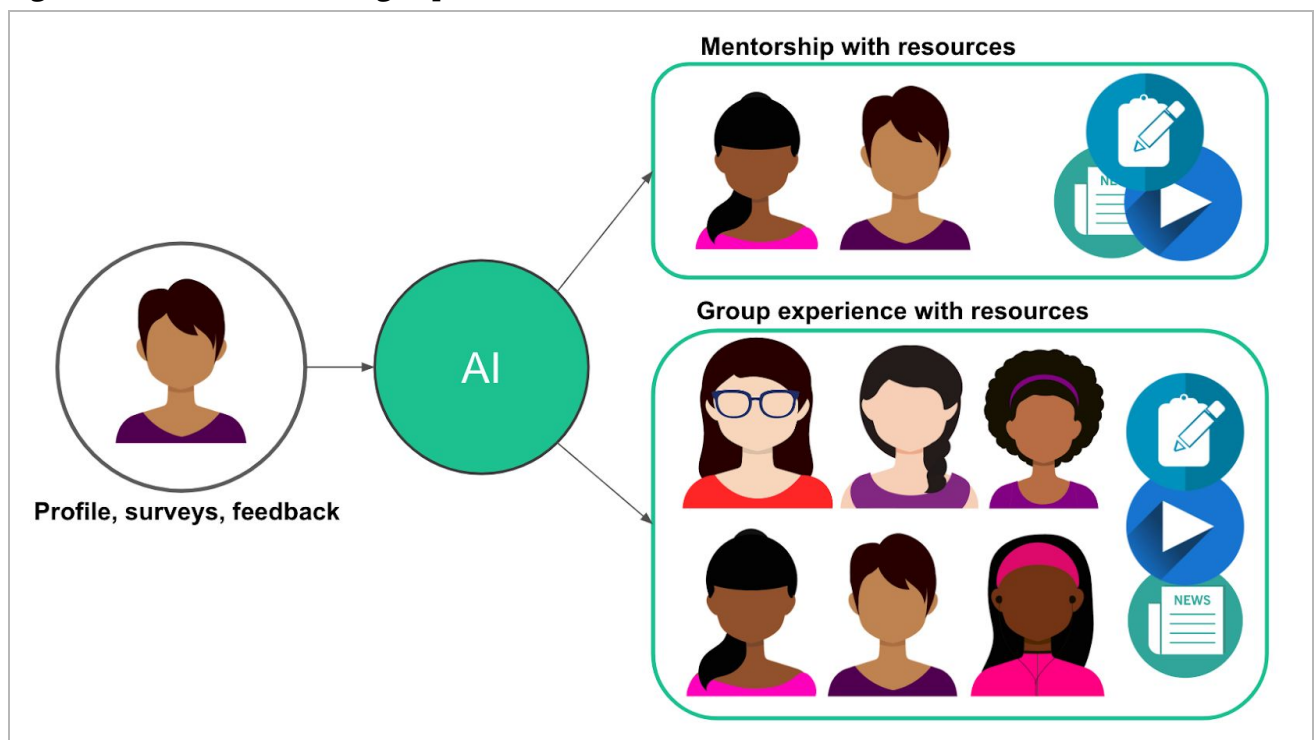
This ability to make sense of large-scale, sparse data is the reason AI is instrumental to understanding skill development needs and linking these to business outcomes. Understanding the relations between many data sources leads to the best understanding of employee performance, skill possession, the relationship to business performance, and therefore ROI. A human being or regular software application would simply not be able to do any of this.

Part 6 Facilitating learning experiences with AI

The organizational evolution from traditional, hierarchical structures to social experiences has contributed to the need for collaborative, human-centric learning experiences. In the future, AI could help facilitate these experiences by connecting people, suggesting resources, learning automatically, and optimizing accordingly.

In order to construct valuable learning experiences, AI can use people data, surveys, feedback, and content attributes to match people to other people and resources. By analyzing historical matches and continuous learner feedback, machine learning models can automatically suggest learning experiences and self-optimize. This way, people can be paired with the best mentor and resources to support their mentorship program, or with the right peers, experts, and resources to collectively go through a meaningful group learning experience.

Figure 7: AI-driven learning experiences



In addition to data-focused AI running in the background, AI can be used to enhance the user experience directly. By understanding what learners have been working on and dynamically suggesting relevant connections and activities, AI can help the user naturally learn and evolve. Other AI technology, like conversational AI and chatbots, can engage at

key points in the user journey to provide proactive guidance and more effectively gather context-aware feedback at natural moments in time.

The combination of machine learning AI, conversational AI, employee feedback, learning data, and external data sources could lead to a platform capable of facilitating learning experiences automatically. As the AI learns more about the learner, it will get better at recommending content, people, and learning paths. This way, learners can follow customized learning experiences, automatically optimized to fit their wishes and needs.

At Everwise, we believe this is the future of learning and development. This is what we're working on. To find out more about Everwise and AI, please reach out to your Everwise representative or contact us via the contact methods listed on the [Everwise website](#).

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