

Meet Your Work Twin

How Digital Twins Are Reshaping Workforce Strategy



By: Sherry Fan, Rebekah Kang, Rachel Shen, Rebekah Tong, Kandy Yuen
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Overview of Digital Twins

The **age-old question** asked by managers around the world: How do you know if a strategy you have designed will result in the desired employee behaviour before implementing it? Companies have yet to find an answer to this question in the ever-changing workplace. To solve this problem, companies have been adapting their HR systems on an iterative basis to keep up with the new generations of employees. One notable way is using digital twins.

Current Trends

Organizations today rely on a range of HR tools to manage hiring, training, and career development. These tools have streamlined processes but also come with significant limitations.

For hiring and recruitment, a common tool is Applicant Tracking Systems (ATS) that help streamline the recruitment process by completing job postings, resume screening, candidate communication, and workflow management¹ while overlooking hidden workers. The process utilizes historical data rather than evaluate a candidate's capacity for growth or adaptability. As a result, organizations tend to emphasize efficiency over accuracy and make incomplete hiring decisions.

When companies train their employees, a common HR tool is a Learning Management System (LMS), a software application to plan, implement and assess a learning process². Many LMS tools struggle to engage employees meaningfully. It is not tailored to individual learning styles or job competencies. Real-time feedback is also uncommon, making it difficult to measure the progression of training.

To manage employee growth and development, many organizations utilize HR information systems (HRIS), which streamlines processes. The limitation is that systems are often siloed views of an employee's history, and potential. HR teams are subsequently limited in their ability to make proactive talent decisions.

While today's HR tools have improved efficiency and scale across hiring, training, and career management, they often fall short in personalization, integration, and accuracy. These gaps highlight the need for a more dynamic solution – one that digital twins can fulfill.

Benefits of Digital Twins

Digital twins can be deployed by simulating future scenarios related to changes in a company's strategy and incentive systems. This article will explain the benefits that companies are realizing through its use.

1 Digital Twins Accelerate Decision-Making

One of the main challenges companies face is designing employee strategies that both motivate employees and align with the company's overall objectives. Simulations allow companies to analyze the effectiveness of various incentive systems, providing companies with insight into the best type of incentive (financial or non-financial) that can motivate employees, and the *sweet spot* for the amount of the incentive that will result in peak employee motivation and performance. Instead of implementing a strategy then reacting by adjusting it, companies can take a proactive approach to see what will work and what won't. By using digital twins, companies can leverage employee data to see how employees will react to accelerate decision-making.

2 Digital Twins Improve Employee Experience

After the COVID-19 pandemic, companies have started placing a greater emphasis on employee well-being. Rather than depending on management assumptions or employee surveys, digital twins can help make data-driven decisions to improve work-life balance and help address the lack of motivation problem. Running hypothetical scenarios with digital twins before releasing changes in incentive systems shows employees that the company carefully considered the change, and enables companies to develop incentive systems that employees value.

¹ Oracle Canada. (n.d.). *What is an Applicant Tracking System ?*. What Is an Applicant Tracking System?

² Hashemi-Pour, C., Kirvan, P., & Brush, K. (2024, October 22). *What is a learning management system (LMS)?*. Search CIO.



The simulations can surface the pitfalls of a specific change in strategy, enabling companies to adapt and revise changes before implementation in the real world.

3 Digital Twins Result in Enhanced Performance Evaluation

A study by the Gdansk University of Technology in Poland found that one of the top 10 benefits of digital twins is performance evaluation, as companies can thoroughly analyze, develop, and categorize a set of scenarios and models before its implementation³. Incentive plans should be both congruent with a company's overall strategy as well as controllable by the employee. Using digital twins to test incentive plans can provide valuable insight on whether the incentives are highly correlated with better performance, and lead to employees exhibiting more desired traits and behaviours. Employees should also be able to affect the results in a material way, to address the lack of motivation problem. Congruency and controllability impact a control system's tightness, and tighter controls provide greater confidence that employees will act in alignment with the organization's strategy. The simulations can surface the pitfalls of a specific change in strategy, enabling companies to adapt and revise changes before implementation in the real world.

Challenges of Digital Twins

Digital twins require continuous collection and analysis of employee data to optimize HR planning, training, and development. However, the integration of simulating hypothetical scenarios introduces significant challenges.

1 Privacy and Data Security Concerns

Digital twins require the continuous collection and analysis of employee data to generate scenarios that incorporate changes to the company's HR strategy. The

volume of data may pose data privacy and security concerns due to the sensitivity of employees' information as they are digitally mirrored into the system.

Without data protective measures in place, employee data may be vulnerable to breaches and identity theft through ransomware attacks⁴. The large data collection in cloud databases and external software used for analyses may lead to cybersecurity attacks⁵ which are particularly a concern when data is gathered without explicit consent⁶⁴. Furthermore, given that the digital twins in HR combine elements of personal and organizational data to provide meaningful insights, data privacy concerns may arise regarding the ownership of the data that has been obtained⁷. To mitigate these concerns, organizations should implement specific and direct regulations and principles to ensure transparency with their employees.

2 Legal Concerns

Under the Canadian privacy law, organizations must obtain meaningful consent prior to collecting personal data. Given that digital twins rely heavily on continuous data for the system to simulate scenarios, organizations should only be able to retain data as long as it is required for the identified purpose⁸. The large database requirements might pose limitations on digital twins analysis. The new act, Personal Information Protection and Electronic Documents Act (PIPEDA), requires businesses to establish a tracking program to monitor consent mechanisms and anonymization of data to prevent private information from being tracked to an individual⁸. This poses a challenge for digital twins as the nature requires linkages to identifiable employees in the workplace. Therefore, developers must find a balance between compliance and the operations of the system. As

³ Weichbroth, P., Jandy, K., & Zurada, J. (2024). Toward Sustainable Development: Exploring the Value and Benefits of Digital Twins. *Telecom*, 5(3), 774-791.

⁴ SHRM. (2023). *AI avatars and digital twins in HR*. Society for Human Resource Management.

⁵ Kuštelega, M., Mekovec, R., & Shareef, A. (2024). Privacy and security challenges of the digital twin: A systematic literature review. *Journal of Universal Computer Science*, 30(13), 1782–1806.

⁶ Aon (2023, April 19). "COVID-19 has Permanently Changed the Way We Think About Wellbeing". Aon.

⁷ Reuters. (2024). *Avoiding growing pains in the development and use of digital twins*.

⁸ Bernier, C. (2023, January 19). 2023 Canada private-sector privacy law reform: Keeping track of moving parts. International Association of Privacy Professionals.

digital twins become more prominent in HR practices, the potential of meaningful consent may pose operational risks if employees withdraw their consent to participate in digital twins.

3 Ethical Concerns

The concept of digital twins is to replicate individuals' skills, behaviours and productivity through data analysis, however, it may raise ethical boundaries if not monitored responsibly. With high volumes of employee data from each consenting individual, it may result in excessive employee oversight. This is because it tracks behavioural data such as communication styles and work routines⁹. Over time, employees may feel discomfort and feel that they are under constant surveillance, reducing employees' trust in their employers and may undermine the ethical practice of autonomy in the workplace¹⁰.

The reliance on historical data may inherently lead to bias, such as past performance ratings and work history and promotions. As such, it is important for organizations to perform scheduled audits over data integrity and fairness to mitigate bias¹¹. The power of digital twins not only simulates scenarios to optimize employee management, but can be a powerful tool to simulate termination decisions, team organizations or changes in leadership, raising ethical concerns¹².

Implementation

When it comes to implementation of digital twin technology, there are four components needed: a physical system, a virtual system, systems data, and a communication interface.¹³ The physical system is the physical item or environment that is intended to be mirrored. In this case, that is the employee. The virtual system is the virtual representation of the physical system (the employee), and any resources that are used to make

this mirroring happen¹⁴. Systems data relates to both the data collection on the physical system, and the data produced by the virtual system which helps in decision-making. A communication interface is the method by which data is exchanged between the physical and virtual systems.

All four of these components are used in the implementation of a digital twin of an employee for HR purposes. When implementing a digital twin, the organization will need to consider the planned uses of the digital twin. Some AI twins are intended as an assistant and source of knowledge, mirroring personality traits and the knowledge base of a specific individual.¹⁵ Others are intended to simulate behaviours of an employee to provide information about their circumstances, generating ideal actions to take to engage, retain, and support personnel. For example, monitoring workloads, predicting desire to leave, suggesting ideal benefits packages, and suggesting needed training all can be identified goals for a digital twin.¹⁶

The purpose of the digital twin will inform what types of data need to be collected on the employee, and the sources from which they will be drawn. Employee calendars and schedules can be collected when considering workload.¹⁷ Employee surveys, performance evaluations, and salaries and promotions can be input into the system to evaluate retention status.¹⁸ Performance evaluation information can be input to determine an employee's weak points and tailor training programs to an employee's specific situation. These are critical aspects of the physical system and systems data.

Next, a virtual system that mirrors the employee will need to be built, as well the software and hardware needed for communication to happen between the physical and virtual system. An organization can look to build in-house if they have the required capabilities, but for those with less experience, this work can be outsourced. For

⁹ SHRM. (2023). *AI avatars and digital twins in HR*. Society for Human Resource Management.

¹⁰ Aon (2023, April 19). "COVID-19 has Permanently Changed the Way We Think About Wellbeing". Aon.

¹¹ Keloc, B. (2024). Exploring the limits: Ethical considerations of digital twins. LinkedIn Pulse.

¹² Helbing, D., & Sánchez-Vaquerizo, J. A. (2022). *Digital twins: Potentials, ethical issues, and limitations* (arXiv:2208.04289). arXiv.

¹³ Fersman, E., & Lv, Z. (Eds.). (2022). *Digital twins : basics and applications*. Springer.

¹⁴ Fersman, E., & Lv, Z. (Eds.). (2022). *Digital twins : basics and applications*. Springer.

¹⁵ Jet BI. (2024, May 20). *Jet BI Digitally Cloned all its Employees Using AI*. PR Newswire.

¹⁶ Pope, C. (2021, July 19). *The case for creating an employee "digital twin."* Workflow by ServiceNow.

¹⁷ Pope, C. (2021, July 19). *The case for creating an employee "digital twin."* Workflow by ServiceNow.

¹⁸ Pope, C. (2021, July 19). *The case for creating an employee "digital twin."* Workflow by ServiceNow.

example, platforms such as ServiceNow and Delve.AI are incorporating digital twin applications in human resources into their current offerings of HR solutions.¹⁹



Case Study: Digital Twins in Action

Zensar is a technology solutions company with over 145 clients that has created a digital twins platform to help businesses with strategic workforce planning²⁰. Specifically, the platform uses HR data to simulate and optimize resource allocation to improve both client satisfaction and the employee experience.

Currently, traditional staffing processes are manual and reactive, resulting in slow implementation due to constant changing demands. Furthermore, lots of data is required in the allocation process as employees must be assessed based on skills, experience, client feedback, and many other factors. As such, the human resources (HR) team at Zensar was looking to improve employee management by implementing a new proactive system to streamline hiring and resource allocation while ensuring opportunities are provided to the right employees with the right skills.

Zensar's platform uses real-time data including employee skills and experience profiles, recruitment data, employee availability, and performance results. This data is then used to create a digital twin to simulate the following situations:

1. *Forward Simulation* → Exploring future “what if” scenarios to predict performance based on current conditions.
2. *Reverse Simulation* → Estimation of required steps and inputs required to achieve a goal.

The outputs of these simulations can include resource allocation plans, hiring recommendations, reskilling

recommendations, lead time forecasts, and bottleneck alerts. By using these outputs, Zensar's clients have reported the following benefits:

1. *Streamlined Resource Allocation* → Zensar's clients have reported that digital twins have improved the tedious manual staffing process by replacing it with data-driven recommendations that simplify the allocation of human resources. This has specifically helped to reduce delays in project completion.
2. *Enhanced Client and Employee Experiences* → Zensar's clients have reported that their employees enjoy being allocated to more meaningful projects that align with their skills and career aspirations. This also benefits clients as they appreciate receiving optimal service through appropriately skilled employees.
3. *Proactive Staffing and Planning* → Zensar's clients feel more confident with their hiring decisions as they can foresee upcoming skills gaps and resource needs rather than having to scramble when performance is nonoptimal.
4. *Data Efficiency* → Zensar's clients have reported that digital twins make data easier to analyze as the platform allows the HR team to run multiple simulations simultaneously with multiple data inputs.

Overall, the key client-reported advantages from these efficiencies are operational speed, cost efficiency, and strategic flexibility. By streamlining the hiring and allocation process with data-driven recommendations, organizations can avoid unnecessary costs by testing staffing scenarios virtually before making decisions.

Conclusion and Future Outlook

Companies that want to capitalize on the vast capabilities of the data-driven information at their fingertips have a possibility to address the rapidly-changing workplace using digital twins. Companies who recognize that digital twins have immense potential will be able to design better employee strategies that align with the company's objectives.

¹⁹ Pope, 2021. ; Delve.AI. (n.d.). *Digital Twin of an Employee: How DTos Improve the Workplace Experience*. Delve.AI.

²⁰Zensar Technologies Ltd. (n.d.). *Who we are*. Zensar. Retrieved July 20, 2025, from