Quick Answer: How AI Techniques Can Help Manage Employee Skills Data

Skills are fast becoming the main talent-related currency in terms of hiring, workforce planning and optimization, career development, talent marketplaces and learning. Application leaders supporting HCM transformations must build AI techniques into their approach to derive value from skills data.

Quick Answer

How can AI techniques help manage employee skills data?

- Apply artificial intelligence (AI) techniques to skills data to:
  - Improve its collection, maintenance and consistency.
  - Improve matching within talent acquisition tools and internal talent marketplaces.
  - Improve learning content recommendations.
  - Improve work assignment in projects or sprints, in workforce optimization and in scheduling.
  - Incorporate labor market data and enable critical workforce segment analysis for strategic workforce planning.

- Use AI techniques including natural language processing and knowledge graphs to detect, infer and analyze skills data. These techniques allow for the inferring of skills and capabilities when these are not explicitly stated or catalogued.

- Use standard competency frameworks, taxonomies, skills assessments and skills repositories as starting points, when they are available. Consider these sources as inherently incomplete.
More Detail

The "half-life" of skills is decreasing. Calls for reskilling and upskilling of talent have continued during the past five years. Publications from the World Economic Forum and the International Labor Organization testify to this. In a recent analysis of IT, finance and sales jobs, Gartner found that 29% of the skills that were present in an average job posting in 2018 will not be needed by 2022 (source: Gartner TalentNeuron).

Gartner’s interactions with clients concerning the use of skills data and the setting up of internal talent marketplaces have increased over the past 12 months. The number of vendor offerings to support skills tracking and talent marketplaces has also increased. Concurrently, both enterprises seeking solutions and vendors proposing them have focused their efforts on using AI techniques to transform how they address the complexity of skills data. AI techniques are applied to remove the heavy administrative burden associated with the collection, maintenance and use of skills data. AI is used to help keep this data fresh, relevant and applicable across many talent processes.

In some organizations, skills data may not exist anywhere, in any system. In many others, skills data is not standardized and is stored across a highly fragmented landscape of systems. Systems supporting learning, administrative HR, recruiting, workforce planning, workforce management, project management and collaboration may all be storing and using completely different skills data. When a competency framework is used, it generally does not feature emerging skills or those representing organization-specific domains of expertise. An extreme example is a retail organization that deployed competency evaluations for all employees in their new HR system — but for only two competencies.

Competencies are defined as broad sets of observable, measurable attributes — including skills and knowledge — that are predictive of effective performance in a given role or job. Knowledge is defined as factual, conceptual, and procedural expertise or understanding of a subject gained through education, training, practice and experience. Skills are defined as individual abilities required to carry out mental operations or physical tasks with intended results. Skills are developed through education, training, practice and experience. The degree of detail included in skills frameworks can vary widely.
Skills data has become a critical component of the automated matching of talent to available work opportunities. Within an internal talent marketplace, such opportunities are likely to be for short-term “gigs” or project work. More granular detail is needed in such cases, especially when compared with a career-pathing use case. For career paths, more emphasis is placed on competencies that allow employees to move between jobs in order to attain another position and fulfill career goals. In a fast-paced and changing world, however, the practice of defining a career goal as a specific position will become obsolete. For a growing number of employees, it is more important to collect experiences and build a portfolio of work that matches their values and career purpose. Demand is therefore moving away from standard competency frameworks that focus on broadly applicable categories. There is increased interest in those that include highly detailed ontologies that incorporate specific skills, expertise, experiences and knowledge. This means moving from thousands of terms in a skills taxonomy to millions, if not billions, of nodes in a skills graph. The application of AI techniques enables this shift.

Skills data is inherently messy, and challenging to detect and infer. Application leaders supporting human capital management (HCM) transformations are faced with a wide variety of solution types to support this shift. A growing number of technology providers embed AI-enabled skills data in solutions dedicated to specific use cases. They include talent acquisition, workforce planning, labor market analytics, talent marketplace, HCM suite, learning experience and learning content providers. Only a few solution providers (such as Burning Glass Technologies, EdCast, SkyHive, TechWolf and JANZZ.technology) have articulated any aspiration to be “agnostic” and integrate with multiple systems and process domains with their skills detection, inference and matching algorithms.

Application leaders must first decide whether to build their own AI capabilities for skills data or buy those offered by technology providers. When deciding their approach, they must answer the following questions:

- Is the solution in question closed (only applicable to the use cases supported by the technology provider) or open (integrable with many different processes and use cases)?
- What data sources are used? Is the data internal only? Is the data limited to HR systems? Is the data focused on recruiting processes or inclusive of learning data?
- Does the provider’s dataset represent a mix of competencies and highly detailed domain or knowledge-specific skill types?
- Are graph techniques used to reference adjacency, proximity and relationships between skills? If other techniques are used, which ones?
- What methods are used to maintain and update models, and with what frequency? Are they mostly interview-based methods or are other machine learning techniques used?

- How ready is the provider to incorporate organization-specific skills, knowledge and expertise into models and the automated inference engines it provides? Can they incorporate internal jargon used to codify specific investment areas, technologies, programs or domains?

- What standards or frameworks are used as key references in the skills inference models? See Figure 1.

**Figure 1: Skills Standards Used to Support the Use of AI for Skills Data**

<table>
<thead>
<tr>
<th>Stable</th>
<th>Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standards for Labor Statistics</td>
<td>Organization-Specific AI-Enabled</td>
</tr>
</tbody>
</table>
- O*NET (U.S. Department of Labor) | - TechWolf |
- PIAAC (OECD) | - SkyHive |
- ESCO (European Commission) | - EdCast |

<table>
<thead>
<tr>
<th>Competency Frameworks</th>
<th>Cross-Domain AI-Enabled Standards</th>
</tr>
</thead>
</table>
- Skills Framework for the Information Age (SFIA) | - JANZZ.technology |
- WAND's DiscoverMe | - Boosters |
- IBM competency models | - JobKred |
- HR consultancies | - Skills in many recruiting, learning talent marketplace and HCM solutions |

Source: Gartner
Notes: O*NET = Occupational Information Network; PIAAC = Programme for the International Assessment of Adult Competencies; OECD = Organisation for Economic Co-operation and Development

**Recommended by the Authors**

Infographic: Artificial Intelligence Use-Case Prism for HCM Technology

How to Build Knowledge Graphs That Enable AI-Driven Enterprise Applications
Hype Cycle for Human Capital Management Technology, 2020

Future of Work Trends Will Drive New Technologies to Track, Develop and Deploy Talent

Innovation Insight for Internal Talent Marketplaces

© 2021 Gartner, Inc. and/or its affiliates. All rights reserved. Gartner is a registered trademark of Gartner, Inc. and its affiliates. This publication may not be reproduced or distributed in any form without Gartner's prior written permission. It consists of the opinions of Gartner's research organization, which should not be construed as statements of fact. While the information contained in this publication has been obtained from sources believed to be reliable, Gartner disclaims all warranties as to the accuracy, completeness or adequacy of such information. Although Gartner research may address legal and financial issues, Gartner does not provide legal or investment advice and its research should not be construed or used as such. Your access and use of this publication are governed by Gartner's Usage Policy. Gartner prides itself on its reputation for independence and objectivity. Its research is produced independently by its research organization without input or influence from any third party. For further information, see "Guiding Principles on Independence and Objectivity."