Executive Summary

Using Workforce Analytics for Competitive Advantage

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Overview

The use of workforce analytics is transforming HR. Organizations are using workforce analytics to plan their future workforce and inform hiring, promotion, and retention decisions. They are using analytics to determine an organization’s most strategic jobs, assess what characteristics in potential candidates are most likely to translate into successful outcomes, and figure out which initiatives and activities have the best ROI.

Successful use of workforce analytics requires that analytics are aligned with the business strategy and are focused on answering specific and strategic questions. Workforce analytics work best when data gathering is a coordinated, cross-functional effort and when analytics are conducted by a team with data scientists, business experts, and multiple stakeholders.

Workplace analytics have the potential to impact workforces and entire businesses, and to create differentiation and competitive advantage.

Context

SHRM Foundation’s 18th Annual Thought Leaders Retreat, “Using Workforce Analytics for Competitive Advantage,” was held on September 26 and 27 in Seattle, Washington.

A select group of top HR leaders gathered to discuss how workforce analytics are being successfully used, benefits and challenges from workforce analytics, and implications for HR and for organizations.

Key Conclusions

The overall business environment is changing rapidly.

We are living in a period of rapid and significant transformation, with high levels of uncertainty and enormous change. Established companies and business models are being disrupted by new players with entirely new models. This is forcing companies to rethink their basic business strategies, reassess the role of talent and their workforce strategies, and develop new approaches to management and decision making.

Huge amounts of data provide a new way to develop insights and compete.

At the same time that massive disruptions are taking place, organizations are generating and sitting on massive amounts of “big data.” Increasingly, organizations are using this data in various functions and across the entire business to compete differently. Analysis of data is informing all types of decisions, including sales and marketing decisions, financial decisions, and other types of critical strategic decisions. Organizations are increasingly viewing analytics as a critical capability, are making more data-driven decisions, and are seeking to differentiate themselves and achieve competitive advantage through analytics.

In multiple sessions at this retreat, speakers emphasized that achieving competitive advantage through analytics requires having the right analytical capabilities in the organization (which are increasingly “data scientists”) and taking a cross-functional team approach, as opposed to focusing on silos or functions.

Workforce analytics need to be aligned with the business strategy and used to solve business problems.

Often, organizations want to take advantage of their huge amounts of HR data and use their workforce analytics capabilities by diving in to analyze the data. However, multiple participants emphasized the importance of first identifying the business question you need to solve, then looking at the data. It’s important to align workforce analytics with the workforce strategy and the overall business strategy. Analytics are best used to answer specific questions and solve specific problems, rather than going on a “fishing expedition.”

Workforce analytics are being used to provide insights and solutions for a host of important workforce and business problems.

Organizations are using workforce analytics in a number of practical ways, including:

- To determine future workforce needs. For extremely large organizations with multiple roles, workforce analytics can be used to predict how many people will be needed in each role at each point in the future. This information can guide recruitment efforts.
• **To help determine an organization’s most strategic jobs.** Most jobs are important, but a key few are truly strategic and have an enormous impact on how the organization delivers value and differentiates itself. Analytics can be used to help assess which roles create the most value. Analytics can also be used to measure performance in these key strategic roles to assess the best and worst performers.

• **To expedite and improve the hiring process.** Google receives more than two million resumes per year. They use analytics to identify which experiences/skills are most likely to predict strong performance at Google, and then they use this information to identify the best candidates from the thousands of resumes received.

• **To better understand and improve retention.** An example was shared of a telecom company with high rates of turnover in the sales function. This company used analytics to predict which individuals were likely to stay with the company and how well different individuals were likely to perform in sales. Using these insights led to a dramatic reduction in turnover.

• **To make more evidence-based decisions.** Companies are using analytics in HR and across the business to create organizational cultures where decisions are informed by data. One example is using analytics to see which initiatives and investments yield the best ROI.

However, as valuable as analytics can be, they cannot be used to replace humans in making all decisions. For example, data scientists at Google believed that analytics and algorithms could be used for some decisions related to employee promotions. Yet even at Google, an extremely analytical organization, many people still felt that “human decisions should be made by humans.” Even those who believe in technology and data didn’t feel comfortable having such decisions made solely based on analytics. Analytics can be used to help inform humans to make better decisions, but shouldn’t replace human decision making.

**As the use of workforce analytics grows, it is important to evaluate ethical considerations.**

In addition to considering how much to rely on data for people decisions, greater use of analytics requires that HR leaders think hard about ethical factors. This includes what data is used, how it is used, how data is protected, and in what ways use of data and analytics might cross an ethical line.
BETTER TALENT MANAGEMENT THROUGH WORKFORCE ANALYTICS

Mark Huselid, Distinguished Professor of Workforce Analytics and Director of the Center for Workforce Analytics, Northeastern University

Overview

In industries across the board, massive disruptions are forcing companies to rethink their fundamental business strategies, their workforce strategies, the role of talent, and their approaches to talent management. While organizations are rushing to adopt workforce analytics, they often focus on the data and metrics.

Before developing new talent management systems and measures, the starting point must be to clarify the organization’s core strategy. This involves answering critical questions about strategic capabilities, the firm’s strategic work, and strategic roles. Only after the strategy is determined, key strategic questions are answered, and the current performance management system is assessed is it worthwhile to develop a new talent management system and new measures, and to find the data to measure performance.

The most important measures will be those where there is high variation in the performance of strategic work. And, an ideal talent management system will be used by line managers, who will be accountable for talent.

Context

Mark Huselid discussed the role and benefits of workforce analytics in developing effective talent management systems.

Key Conclusions

Massive disruptions have resulted in new workforce realities.

Disrupted environments are forcing industries across the board to rethink their strategies if they are to remain competitive. In transportation, for example, the world’s largest taxi company, Uber, owns no vehicles. The largest telecommunications company, Skype, owns no teleconference infrastructure. And Airbnb, the worldwide leader in accommodations, owns no real estate.

These disruptions have resulted in a new set of workforce realities for companies in every industry.

- Old sources of competitive advantage no longer differentiate firms in the global marketplace.
- Effectively responding to globalization requires flexibility, speed and innovation, and talent.
- The market for talent is becoming much more “efficient.”
- There is an intense focus within firms on workforce strategy, differentiation, and execution.

What this means is that the role of talent and building organizational capabilities is now quite different. And, as the role of talent changes, so too must the measurement systems and the metrics to manage talent.

Doing talent management and measurement right starts with the strategy and answering key strategic questions.

Most organizations have a huge amount of data on hand, and organizations implementing workforce analytics often rush to find data and begin measuring things. This is the wrong approach. Doing measurement right starts with strategy.

“We try to teach and help people learn that ironically, it’s not about the data. It doesn’t start with the data. It starts with the questions you need to answer. If you can get the questions right, the data comes much easier.”

– Mark Huselid

All businesses need a strategy, which answers how the organization is going to compete, create value, and win. And every organization needs a workforce strategy that identifies which jobs create wealth and where the organization will invest or disinvest in the workforce. The strategy leads to designing and delivering an infrastructure for managing talent. In order to develop a workforce strategy, a talent management system, and metrics, it is important to first ask and answer:

- How do we identify and quantify the strategic capabilities—bundles of information, technology, and people—that drive our strategic success?
- What are the key strategic positions in our firm and how should they be managed?
- How do we identify and quantify the strategic work that has a major impact on value creation in our firm?
- How well is our strategic work currently being performed? What work needs to be added or deleted?
- How do we develop strategic talent inventories that help us identify 1) the talent we have, 2) the talent we need, and 3) what actions will close this gap?
- How do we design and implement measurement systems (HR and Workforce Scorecards) that ensure managerial accountability for a firm’s most expensive resource, the workforce?
- How well does our current performance management system help us execute our business strategy? Our compensation system?
- How effective is our pipeline at producing “A” level strategic leadership talent?
- How can we equip both HR and line managers to use data and analytics to improve the quality of decision making?

<table>
<thead>
<tr>
<th>What Do You Want to Know About Your Workforce?</th>
<th>Performance</th>
<th>Position</th>
<th>Question Asked</th>
<th>Question Answered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>- Is our workforce satisfied / happy?</td>
<td>- Is our top talent in strategic positions thrilled with our firm?</td>
<td></td>
<td></td>
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<tr>
<td>Work Design</td>
<td>- How do we do our work?</td>
<td>- Are we focusing on value creation in every job?</td>
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<td>Selection</td>
<td>- Are we “fair” in our selection process?</td>
<td>- How well does our top talent in strategic roles compare to the labor supply?</td>
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<tr>
<td>Training/ Development</td>
<td>- How did our participants feel about our training?</td>
<td>- How can we accelerate the skills of our emerging talent in strategic roles?</td>
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<tr>
<td>Performance Management</td>
<td>- Are performance appraisals completed and on time?</td>
<td>- Is our performance management system a tool to help execute our business strategy?</td>
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<td></td>
</tr>
<tr>
<td>Rewards</td>
<td>- Is our program fair?</td>
<td>- Are we adequately rewarding our value creators for their success?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

““What is the work that’s going to move you forward? Where is it located? How well are you doing it?”

– Mark Huselid

Measurement systems should focus on variance in performance in key strategic roles.

Almost all jobs are important to an organization’s success, but only a few have major strategic impact. Among the key questions that must be answered, none are more important than determining the strategic work that has a major impact on value creation, and identifying the strategic roles within the organization.

It is important to keep in mind that strategic jobs can be found anywhere in an organization, not just at the top where organizations historically have invested the most development dollars. Based on the particular industry and company, a strategic role might be a project manager, a software engineer, or a customer service representative. When strategic roles are identified an effective practice is workforce differentiation, which means not treating all roles the same, but treating strategic roles differently.

Also, once strategic roles are identified, analytics can measure the variance in performance between people in the same role. Microsoft’s former chief scientist once said, “The top software developers are more productive than average software developers not by a factor of 10X or 100X, or even 1,000X, but by 10,000X.” Thus, a key role for analytics is measuring the variance in performance to identify what distinguishes the top performers.

When measurement systems and measures are developed, it is important for these systems and measures to be used by line managers, who are held accountable for talent. In many organizations, 60-70% of the organization’s spend is on talent, with only about 1% of spending on HR. Therefore, effective talent management doesn’t reside in HR; HR develops systems and tools that are used by line managers.

“The greatest potential opportunity to impact firm performance is likely to be located in [some very specific] strategic positions. But we’ll never know unless we build an analytical framework and collect the data we need to help us understand how talent makes a difference.”

– Mark Huselid

Another Important Point

- Accounting for talent. If a company invests $100 million in a building, accounting rules allow that capital investment to be expensed over many years, and shown as an asset on the balance sheet. However, when an investment is made in talent, accounting rules require the entire expense to be taken in the current year. This views investments in talent as short-term and influences managerial thinking. The accounting rules should be changed to account for talent investments over many years, similar to physical assets.
Overview

In recent years, HR teams have become more proficient with analytics. This is evident at companies like Jack in the Box, Johnson & Johnson, and Microsoft. Jack in the Box has quantified how employee efforts contribute to the bottom line. J&J’s organizational analytics group has aligned its work around key growth drivers, and analytics enable evidence-based workforce decisions. Microsoft’s HR Business Insights team is composed of groups that develop data-based recommendations on topics ranging from internal mobility to onboarding.

Context

Panelists from Jack in the Box, Johnson & Johnson, and Microsoft discussed how their companies have integrated talent analytics into the organization.

Key Conclusions

In recent years, HR’s understanding and use of analytics have evolved significantly.

In 2011, the SHRM Foundation evaluated where HR stood on information, analytics, and risk. The key themes at that time included:

- An ongoing struggle with definitions.
- Increased recognition that talent is a major business risk to be managed.
- Over-reliance on benchmarking.
- A lack of connection between talent metrics and business strategy and metrics.
- Weak use of predictive models and few leading indicators.
- Many tactical measures.
- No use of analytics to make strategic choices.

In fast forwarding to 2015, it is clear that HR’s use of analytics has evolved significantly in some organizations, but for many its potential still lags best practices. The Rise of HR by Dave Ulrich, Bill Schiemann, and Libby Sartain identified the following themes:

- HR needs to understand the business value proposition and use aligned strategic metrics as a beacon.
- The right questions establish the “big picture.”
- HR needs to shift from hindsight to foresight. It has the potential to move from simple descriptive statistics to inferential statistics and to modeling. Leaders want to know what will drive important outcomes (in the future), rather than what has driven important outcomes (in the past).
- Practices must focus more on practical implications and using evidence-based decisions.
- HR and all functions must demonstrate value.

Jack and the Box and Qdoba employ thousands of people. One key to the company’s success is ensuring that employees understand and care about the company’s strategic objectives.

Jack in the Box and Qdoba use talent analytics to highlight how employees add value and support strategic objectives.
goals. Ways that Jack in the Box uses talent analytics to identify how employees add value to the business include:

- **By understanding the value proposition for different stakeholders, it is possible to identify what data is important for HR.** Key stakeholders for Jack in the Box include guests, employees, owners/franchisees, and shareholders. HR teams must navigate what HR expert Dave Ulrich calls the “stakeholder paradox.”

- **An organization’s strategic enterprise architecture is rife with questions that can help improve the business.** At Jack in the Box a key enterprise enabler is supply chain. The company realized that both Jack in the Box and Qdoba buy chicken, so unifying the supply chain was a key enabler for strategic execution. From an HR perspective, it was important to identify key positions and talent in the supply chain function. A best practice is to focus on the “big blocks,” such as: What is the business trying to achieve? What will it take to achieve those goals, based on the needs of different stakeholders? The most critical place to focus is on areas where you can enable strategic execution.

- **It is important to understand how the business makes money from a people perspective.** Jack in the Box discovered that 50% of the value of each restaurant’s average unit volume can be attributed to guest expectations, which are delivered through people. The team drilled down to discover that guest expectations are tied to the moment of truth in restaurants. This type of data helps build the business case for investment in people, HR systems, processes, tools, and more.

At each Jack in the Box the menus, reward systems, and organization structures are the same. The only difference is the people. The top and bottom quartiles differ on sales data, as well as on operations data like speed, consistency, and friendliness. The top performers provide a better guest experience, as well as stronger sales performance.

### Strategic Enterprise Architecture

![Diagram of strategic enterprise architecture]

- **Enterprise Brand Strategy:** Establishes vision, mission, and core values for the organization.
- **Qdoba:** Focuses on key brand elements, such as brand identity, customer experience, and supply chain.
- **Brand Connection:** Creates a strong bond between the brand and the customer.
- **Operating Systems:** Implements operational strategies to support the brand.
- **Consumption Moments:** Identifies critical moments of truth for the customer experience.
- **Brand Execution:** Ensures consistent delivery of the brand promise.
- **Key Enablers:** Identifies critical factors that drive success, such as customer satisfaction and operational efficiency.

### Providing a Better Guest Experience

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<th>Metric</th>
<th>Top Quartile</th>
<th>Bottom Quartile</th>
<th>Delta</th>
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<tr>
<td>Alerts Per 10k Trans</td>
<td>4.5</td>
<td>7.3</td>
<td>2.8</td>
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<tr>
<td>VOG Overall Satisfaction Top Box</td>
<td>73.9%</td>
<td>70.4%</td>
<td>3.5 ppts</td>
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<tr>
<td>Speed of Service</td>
<td>4.22</td>
<td>4.40</td>
<td>0.18</td>
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<tr>
<td>VOG Organized, Fast, &amp; Efficient Top Box</td>
<td>73.6%</td>
<td>69.6%</td>
<td>4.0 ppts</td>
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<tr>
<td>VOG Friendly Top Box</td>
<td>77.6%</td>
<td>74.6%</td>
<td>3.0 ppts</td>
</tr>
<tr>
<td>VOG Order Inaccuracy</td>
<td>5.2%</td>
<td>6.8%</td>
<td>1.6 ppts</td>
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<tr>
<td>Food Safety Score</td>
<td>96.9%</td>
<td>93.5%</td>
<td>3.4 ppts</td>
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</tbody>
</table>

“**It’s not enough to say that people are our most important asset. You need to know where and how people add value to the business.**”

- **Jack in the Box built its leadership framework around key talent metrics.** The company has leveraged Metrus Group’s People Equity ACE Scorecard, which focuses on alignment, capabilities, and engagement. Jack in the Box recognizes that employees want to be connected to something bigger than themselves. Team members must understand how their daily work supports the company’s broader purpose.

### People Equity

- **Goals**
- **Competencies**
- **Advocacy**
- **Brand**
- **Information**
- **Commitment**
- **Customer**
- **Satisfaction**
- **Resources**
- **Engagement**

**Alignment**

**Capabilities**

**Engagement**

Building Capability and Expertise

- When building a measurement system or scorecard, focus on insights the data provide, rather than the data itself. Jack in the Box uses green/yellow/red coding on its scorecard and breaks out data at the restaurant level. By analyzing data at the lowest level, organizations can identify best practices to be scaled enterprise-wide. Scorecards highlight areas with opportunities for the biggest returns.

Restaurants that score high on the ACE scorecard have lower turnover, higher productivity, fewer guest problems, higher guest satisfaction levels, and higher problem-resolution rates than at their lower-scoring peers. In addition, high-scoring restaurants enjoy 10% higher sales and 30% higher profits, due to factors like less food waste and more efficient teams. Jack in the Box has made the cultural shift needed to tie ACE measures to variable compensation.

Johnson & Johnson’s organizational analytics group enables evidence-based workforce decisions and improves business outcomes.

J&J is a global healthcare leader with more than 265 operating companies in 60 countries and around 126,500 employees. Innovation is the company’s lifeblood, with 25% of sales coming from products launched in the last five years. Keys to the creation of J&J’s organizational analytics group include:

- The mission of the group is to enable evidence-based workforce decisions, leading to improved business outcomes. The group’s vision is to be recognized as an industry leader and key business partner for developing a workforce strategy and driving data-based decisions. To accomplish these goals, the team developed a three-part strategy:
  - Promote a culture of analytics to increase data-based decisions.
  - Focus on projects that leverage talent insights to deliver business outcomes, while building workforce analytics capabilities.
  - Use differentiators including analytics expertise, business acumen, and the ability to see internal and external trends.

- When the team began, it leveraged external experts to build internal analytics capabilities. Over time, the organizational analytics group has evolved from reliance on opinions and anecdotes to emphasis on predictive analytics. The team still works with descriptive analytics, since they can support important workforce decisions. This group has also formed partnerships with universities, consortia, and consulting firms.

Microsoft’s HR Business Insights group analyzes data, develops workforce insights, and helps line organizations implement programs and tools.

Microsoft’s HR team is composed of 1,500 employees worldwide. The organization has five centers of excellence (COEs) and line (customer-facing) teams that include HR business partners, talent management, and OD. The COE/Line model has been in place for 10+ years. HR is a shared services model within global HR operations.

The HR Business Insights (HRBI) group is part of the Talent Learning and Insights COE. To deliver on the vision of data-driven HR, HRBI is organized around four core teams that partner seamlessly:

1. **Advanced Analytics & Research.** This team is composed of individuals with advanced degrees in statistics and industrial organization and psychology. Team members go deep in the data and develop insights that the Workforce Data Insights team takes to the line organizations.

2. **Workforce Data Insights.** This group helps the line organizations implement workforce data insights. Currently, it is a client-aligned team, but this may change as line leaders develop stronger skills.

3. **Workforce Data Solutions.** This team focuses on reporting and analytics tools and technology. They teach others to use these tools on their own.

“Previously, we relied more on opinions and anecdotes. Today, we have a stronger focus on predictive and prescriptive analytics.”

— Doug Grant

4. **Workforce Data Programs.** This group partners with the COEs to ensure that programmatic decisions are supported with data.

The HRBI group has had a positive impact in several areas, including:

- **Internal mobility.** Although attrition at Microsoft is low, many were concerned that employees were leaving because their next career opportunity was not available at the company. The HRBI team framed the internal mobility issue in more detail. They found that the company had enough opportunities, and that if people look, they can find what they are looking for. The data revealed:
  - Recent transfers are more positive about their career and more engaged than non-transfers. Employees who transfer have higher levels of engagement and a better perception of career possibilities.
  - Transfers are more likely to stay at Microsoft than non-transfers. The one-year attrition rate for transfers is 4% lower than non-transfers.

- **Onboarding.** Research found that small details can have a major impact on the onboarding experience. Key findings include:
  - 1:1 meetings with new hires are important. New hires that had 1:1 meetings with managers within their first week were more satisfied with their overall onboarding experience and manager/team involvement in the onboarding process. In addition, new hires who had more frequent 1:1 meetings (weekly and bi-weekly) with managers during the first 90 days perceived having greater impact on their team’s success than those who met with managers less frequently.
  - Receiving a computer on day one reinforces cultural alignment. New hires who received their computers on their first day tend to be more aligned to Microsoft’s culture.

“**You don’t have to answer the most complex question right up front. Sometimes it’s the quick wins that make leaders come back and ask for more. That is what got our senior management to realize the value that the HRBI function had in the organization.**”

― Dawn Klinghoffer
HR ANALYTICS: Panacea or Placebo?

Alec Levenson, Author, Strategic Analytics, and Senior Research Scientist, Center for Effective Organizations, Marshall School of Business, University of Southern California
Alexis Fink, Director, Talent Intelligence Analytics, Intel Corporation

Overview
Data that was challenging for HR to gather in the past is easily accessible today, and organizations are looking to HR to analyze that data and deliver a strategic advantage. How HR teams and businesses approach that data, its analysis, and the findings can significantly and positively impact the organization, but only if the right questions are asked and the right data sets are analyzed.

Context
Alec Levenson and Alexis Fink discussed how HR teams can analyze and use data to support the business and its strategies.

Key Conclusions
Know the focus of the analysis; the right data tells the right stories.
The key to a successful analysis project isn’t having team members with advanced statistical training; it’s knowing the focus of the project.

An estimated 80% to 90% of HR analysis projects focus on how the business can keep the lights on: maintain or slightly improve current operational performance. Some projects are bigger, looking at what it takes to move the needle and stir things up so that performance is increased significantly against organizational strategies. Both types of projects are important to the business, but require different orientations to help the business succeed.

The value of analytics is in discovering how it can make a difference to the organization.
Analytics findings can be surprising and exciting, but the most valuable information makes a significant difference in the organization. Predictive analytics shows what is going to happen in the future, but the value is in prescriptive analytics, which shows what to do to change the future.

Finding value begins with asking the right question as a starting point. Many managers come in to the project with a set of data to mine and analyze and no specific question to answer.

“Anything that you want to do in an organization can have a positive impact, but there is an actual economic cost.” – Alec Levenson

Analytics help businesses determine where to spend money to get the highest ROI.
Every business has a limit to how much can be invested in any process or person. Analytics help organizations understand the potential ROI to determine where and how to spend money to improve the business in a way that yields the greatest return.

“Anything that you want to do in an organization can have a positive impact, but there is an actual economic cost.” – Alec Levenson

Strategic HR personnel can push back on business leaders, when necessary, to understand what a particular project is going to accomplish, and prioritize it—and its potential ROI—among competing objectives across the organization. They can also identify when a project is an ego play versus a strategic benefit to the organization.
Another Important Point

• **Downside of minimizing turnover.** Turnover reports and retention analysis are popular within organizations. Businesses may want a low—or even zero—regrettable turnover rate so they don’t lose top employees. This is achievable by hiring people who are just above average. These employees will meet performance criteria and satisfy organizational objectives. But this hiring practice will not attract the “rock stars” who are likely to contribute significantly to the business and leave for better opportunities elsewhere.

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**Analyzing at the team level, rather than the individual level, can offer big returns.**

Among the projects with the most impressive financial returns and performance improvements—often in relatively short time frames—were those that focused on and reworked a team, rather than an individual position.

In one case the cycle time for a specific team was reworked to go from 28 days to 28 hours. Although business leaders came into the project insisting that new equipment was needed, no new equipment was added. Instead, changes were made to the teams, the jobs, the organization, and the work design to ensure the process flowed through the right people to get things done.

Traditionally, organizations look at and try to solve the performance of people first, with an emphasis on resolving individual problems. But a higher ROI can be achieved by flipping the process to analyze and resolve team and organizational-level problems first.

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“The point is, really, to optimize where there’s value. Where is the most opportunity in the organization, and how do you trade off among all of these things?”

— Alexis Fink
Overview

The analysis of big data in HR can be powerful in better understanding and solving complex organizational problems. Analytics can lead to broad conclusions, reveal patterns of behavior, help identify root causes of systemic problems, and predict human performance. When used effectively, analytics in HR can have a positive ROI and significant business impact.

A case study of analytics to reduce turnover at a telecom company showed that analytics can provide “a single source of the truth.” Analytics provides facts, which removes mysteries, emotions, and intuition. Analytics can be used to predict human behavior, such as which sales reps will stay and how they will perform. But there are often political barriers to using and accepting the results from analytics. Success requires thinking of talent issues as business problems, not HR problems, and forming cross-functional teams where data is shared and problems are addressed.

Context

In sharing a real-world case study, Greta Roberts described how analytics can be used to address HR problems and highlighted the political and ethical issues associated with analytics in HR.

Key Conclusions

The premise of HR analytics is that data can predict human behavior and performance.

Talent Analytics was founded about 15 years ago based on the idea that it was possible to use data to predict employee and candidate performance before hiring someone. Analytics has also been used to predict human behavior in multiple domains, including whether customers will buy, whom a person will vote for, whether a particular person will repay a loan, and much more.

Creating reports and dashboards can be a good first step in uncovering patterns of behavior.

HR departments typically have a great deal of data but often don’t put this data to good use. For HR departments faced with solving a problem like high turnover, reports and dashboards populated with existing data can help the organization better understand the situation. Presenting data enables organizations to replace personal intuition with facts.

“...they [Regional Managers] started to see there were some real regional differences.”

Collecting and sharing HR data has benefits but also unintended consequences.

While data presents objective facts, sharing it can be risky, with unintended consequences. In the case study, when data about turnover was provided to sales managers, rather than encouraging collaborative problem solving, it resulted in political resistance and fear. Managers were anxious and proprietary about their data, and questioned its accuracy. This resistance initially created a barrier to taking action.
An important use of analytics in HR is identifying the characteristic of those most likely to succeed.

In the case study the company decided to define the “sales DNA” to indicate the key characteristics of sales reps who succeed. Hiring managers had historically relied on personal judgment and intuition in hiring decisions. Using data can show the characteristics of those sales reps who last longer and perform best. Data doesn’t lie; it removes emotion and politics.

Focusing on sales DNA led the telecom company to use a rigorous data science approach to determine what kinds of reps succeed and to discover patterns in assessment factors (inputs) that led to how long someone lasted and how well they performed (outcomes).

“We wanted to make sure we have top, bottom, and middle performers in [the analysis], and then use predictive techniques to discover patterns between the assessment factors.”
— Greta Roberts

Ethics come into play when an organization has access to personal data; know where you draw the line.

Using analytics in HR can raise ethical issues. What is the right kind of data to collect? From where and from whom? Do we use data from social media, and is it legal to do so? How much data is enough? How far do we dig into people’s lives? Is it ethical to hire someone for a role where they are likely to fail? Do you fire a manager whose team is underperforming due to an underlying structural problem? These questions need to be top of mind when dealing with big data. Most importantly, companies have to answer, “Where do I draw the line?”

“This is a new industry. You’ve got to be very circumspect . . . and understand that you are going to make some errors. “
— Greta Roberts

Another Important Point

• Dealing with biases. While data is inherently neutral, human interpretation is not. Most people are naturally predisposed to accept or look for data that agrees with their beliefs, which colors their interpretation of data. While we may not be able to access our subconscious, recognizing that bias is a factor is useful in interpreting data more objectively.
The Air Force is using Human Capital Analytics in new and different ways. The Air Force has a wealth of data, but historically hasn’t used it to conduct strategic analysis. And, the Air Force hasn’t connected its human capital and analytics strategies to its overall strategy. This is changing. There is an Air Force Strategic Master Plan that fits with the overall National Defense Strategy. In the last year, the Air Force has started creating an Air Force Human Capital Annex, as part of the Master Plan. Further, an Air Force Analytic Strategy is being created to fit with the Master Plan.

As Human Capital Analytics receives more attention, the way it is being used is evolving.

- **Past: traditional analyses.** Previously, analytics focused on transactional or descriptive analyses which provided dashboards and reports about what had happened.
- **Present: increasing business value.** There is increasing focus on analyses to understand why something happened. This is turning data into insight.
- **Future: strategic analyses.** This is going a step further to conduct predictive and exploratory analyses to improve and optimize the organization. This goes beyond using data to explain what happened; it is using data to anticipate and plan for the future. The idea is to use data and analyses to inform and help shape HR policies and programs.
In a world of big data it is important to have “data stewards” who are in charge of data systems.

**Effective use of analytics requires building an analytics team.**

Analytics is a team undertaking. Key team roles include:

- Operations researchers, who really understand the business
- An HR professional to help staff the team
- Data scientists who can access and analyze data
- A mathematician
- A graphics guru to help present and communicate data and insights from it
- A team lead who can guide the team and clearly communicate the findings

For an analytics team to succeed it needs:

- A clear purpose and vision
- The ability to take an enterprise-wide perspective when analyzing data
- To cultivate a data-driven culture
- To focus on projects that solve key business challenges

Multiple tips can help organizations improve the use of workforce analytics.

Based on his experience with analytical projects in the Air Force, Jerry Diaz shared multiple thoughts and tips on ways to help organizations get the most out of analytics. These include:

- **Understand the problem.** Focus a great deal of effort on understanding the problem you are trying to solve. Often people ask the wrong questions and are focused on the wrong problems. Lincoln said if he had six hours to chop down a tree, he would spend the first four hours sharpening the ax.

- **Employ a variety of methods in problem solving.** Rephrase the problem. Expose and challenge assumptions. Try to generalize the problem or break it into smaller pieces. Make the problem positive and focus on what can be done.

- **Strive to turn data into knowledge.** Data has value, but even greater value is analyzing data and turning it into insight and knowledge. “A good analyst turns data into information, but a great analyst turn information into knowledge.”

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For example, the Air Force is using data to look at what factors affect retention. The chart below summarizes analyses of the top 10 influences of why married airmen stay, with influences sorted by gender and by enlisted personnel or officers. Such analysis can be used to improve programs and initiatives to boost retention. Also, the Air Force can look at the cost and effectiveness of various programs, producing an analysis of the return on investment.

“For we need to link this [data and analyses] back to programs and policies, and that’s what we’re in the process of doing.”

— Jerry Diaz

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**Big data takes analytics to a new level.**

The Air Force has multiple data systems and collects enormous amounts of data on each person in the Air Force. Big data involves the collection of data from multiple sources, and entails a high volume, high velocity, and high variety of data.

What makes big data unique is that it is a different methodology from the scientific method. With the scientific method, a person makes an observation of a system, creates a hypothesis, conducts an experiment, analyzes the results, and draws a conclusion. Big data is different. A person lets the data drive the hypothesis.

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“A good analyst turns data into information, but a great analyst turn information into knowledge.”

— Jerry Diaz
• **Focus on communication.** Often analysts are in the weeds. It is important to think about how best to communicate analytical insights and knowledge, especially visually. It shouldn’t take an analyst or a Ph.D. to be able to read a chart.

• **Resist the urge to build big models.** Multiple small models can be more useful.

• **Emphasize accuracy, not precision.** In some way, all models are wrong because they are based on assumptions. Be generally accurate but don’t agonize over precision.

Most importantly, keep in mind that the purpose of analysis is to help inform a decision, but analysis needs to be combined with judgement, intuition, and the politics of a situation.

“They are the instrument, not the decider.”

– Jerry Diaz
Another difference is that with small data, the audience being analyzed is clearly defined and understood. With big data the audience is not understood. It is important to realize that a huge amount of data scientists’ time is spent cleaning and wrestling with data to make it suitable for analysis.

There are different approaches and methods to data analysis.

Two approaches were discussed: the social science and the data science approach.

- **Social science approach:** With this approach there are a small number of known factors that explain a behavior. Researchers build a model based on the premise that A, B, and C lead to a specific behavior. Statistics are used to validate and test the model. For example, to predict income of people in the workforce a model might be developed using variables like age, education, and experience. The output might be a conclusion that “Income is a function of age.” Or, an inverse sequence could be used where variables are plugged into the model, which predicts a person’s income. This approach is transparent, allowing people to see and understand how the model works.

- **Data science approach:** This is a messy marriage of big data, artificial intelligence, and machine learning. Data science is essentially an invisible black box that spits out a number. This approach doesn’t care which factors are connected, as long as the method produces an accurate prediction. Data science may produce good predictions, but the method is not explanatory; it is not possible to explain why a certain prediction is made. The social science approach is concerned with having a theory that explains something. The theory informs the data that is collected and what is tested. Data science, in contrast, is not theoretical. It is about applying tools to accurately predict. Either approach can work with big or small data; neither approach is necessarily better.

"It comes down to what you really care about . . . . Do you really care about explaining and understanding a phenomenon or about predicting that phenomenon?"

– Mark Rivera
Google has experimented with data science in HR in multiple ways.

Data scientists at Google pondered, “Can we do something cool with our HR data that allows us to improve how HR decisions are made?” Data science has been used by Google to attempt to improve hiring, determine promotions, and reduce attrition.

**HIRING**

Google receives about two million resumes per year, many from brilliant, well-qualified people who don’t get hired. Having personnel review this many resumes is not practical.

Google’s data scientists had the idea of using machine learning to improve the efficiency and effectiveness of the hiring process. By viewing the contents of resumes as data, and by putting this data into a massive database, an algorithm could be built to automatically analyze resumes. The algorithm could also identify candidates whose resumes contained terms and characteristics common among people already at Google. (The terms and characteristics screened for were reviewed by Google subject matter experts in different roles.) Data scientists built models that sorted resumes of candidates who had not been initially hired into three groups:

1. Candidates initially turned away who were pushed through the system a second time. Few were hired.
2. Candidates with terms or characteristics on their resume which Google’s algorithm showed were common among people already at Google. A much higher percentage of these people were hired.
3. In this group, not only did the algorithm identify resume terms or characteristics that matched those of existing employees, but the data scientists allowed the machine learning algorithm to add weights to the terms and characteristics. This has been extremely successful and has led to hiring hundreds of people.

**PROMOTION**

Google has a rigorous, labor-intensive process for determining promotions. Data scientists thought they could improve this process by building a model to identify candidates who should obviously be promoted. The model was very good for about 30% of cases, which would allow promotion committees to focus on the 70% of people where the model wasn’t as clear.

However, those on Google’s promotion committees hated this use of algorithms. They complained, “You cannot let an algorithm make this decision; it is too important.” Even at a technology company like Google, people believe that people should make people decisions. Google no longer uses algorithms for people decisions. The data scientists reframed their work to focus on providing data to inform the promotion committees to help them make better decisions.

**ATTRITION**

Predicting attrition lends itself to modeling. The social science approach would have a theory on why people leave a company, would create a model to show the factors causing people to leave, would identify individuals likely to be at high risk, and would inform policy choices to lower attrition.

The data science approach would predict those people at high risk of leaving, but wouldn’t provide reasons for this prediction.

Google has used both approaches. Practitioners must balance between having a model that predicts who will leave but doesn’t give the rationale for the prediction, versus having a model that shows why people leave but lacks the predictive power.

Google’s experience provides important lessons.

Takeaways and lessons from Google’s experience include:

- **Data science takes a team.** Multiple skillsets are needed that don’t exist in any one person. A team with diverse skills is required.
- **Data management tools are needed.** The types of tools needed vary based on how big the data is. Sequel may work initially. For bigger data a more powerful infrastructure is required. Powerful tools include R and Python.
- **Variable selection is important.** With big data, it is important to collect the right variables to do analysis.
- **Scalability is important but hard.** Organizations often want to see initial results from a data science experiment before making significant infrastructure investments.
- **Perceived fairness is essential.** People need to believe the system is fair and must trust it.

**Ethical considerations should not be overlooked.**

Even when data is de-identified, at times it can still be possible to back into the source of the data. For this reason, data owners must be extremely cautious. Google puts a tremendous amount of effort into protecting user data.

“We asked what information can we provide [the promotion committees] to help them make a better decision, but the algorithm isn’t actually making the decision . . . You can’t just trust what an algorithm spits out without having some sense of understanding the context.” —Mark Rivera
Another ethical consideration is realizing that algorithms are not smart or human; they only do what they have been told to do. But if an algorithm is developed or trained based on past assumptions (such as data about who has been promoted in the past), the algorithm may unintentionally build in past biases.

“If you [use machine learning] to train the algorithm based on who’s been promoted in the past, you’re going to maybe make the same mistakes you’ve made historically . . . you’re going to be cementing biases in your processes. That might not be what you want to do.”

— Mark Rivera

Other Important Points

- **Data science in healthcare.** There will soon be algorithms able to make better diagnostic decisions than doctors. But people still want humans in white coats. Healthcare needs to be cautious in proceeding with algorithms.

- **Netflix nirvana.** The vision of Netflix’s CEO is for a consumer to turn on their TV and have it immediately know what a consumer wants to watch at that moment, based on artificial intelligence and predictive analytics.

**Thank You**

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BIOGRAPHIES

Mark H. Blankenship, Ph.D., is executive vice president and chief people, culture & corporate strategy officer for Jack in the Box Inc. He is responsible for the company’s human resources, compensation & benefits, Jack’s University, training & development, consumer intelligence & analytics, internal brand communications and corporate strategy process. Blankenship also serves on the board of The Jack in the Box Foundation, a nonprofit organization that focuses the company’s charitable donations to make a difference in communities where employees, franchisees and guests of Jack in the Box® restaurants work and live. Blankenship joined Jack in the Box Inc. in 1997 as division vice president of training, and later was named division vice president of training and development and field human resources. In 2005, he was promoted to vice president of human resources, and in 2010 he became senior vice president and chief administrative officer. He was promoted to his current position in November 2013. Prior to joining Jack in the Box, Blankenship was vice president of human resources for Mitchell International, a San Diego-based company that provides information products, software and e-business solutions to the insurance industry. Blankenship has a doctorate and a master’s degree in industrial organizational psychology from the California School of Professional Psychology in San Diego and a bachelor’s degree in psychology from California State University, Sacramento.

Alexis A. Fink, Ph.D., is currently director of talent intelligence analytics at Intel. Her organization provides original organization-al effectiveness research, HR analytics, talent marketplace analytics, HR systems and tools, and consulting on talent solutions. Prior to Intel, Alexis spent seven years at Microsoft, where her roles included director of talent management infrastructure. Her career has been characterized by an integrative approach to HR, including developing and implementing competency systems and integrated talent management systems. Her background also includes work in large-scale organizational transformation. Alexis earned her Ph.D. in industrial/organizational psychology at Old Dominion University. In addition to practicing and leading in organizations, she continues to teach, is a frequent SIOP contributor, and an occasional author and journal editor.

Doug Grant is the director of total rewards and organizational analytics for Johnson & Johnson (JNJ). Doug leads JNJ’s global organizational analytics team, which is responsible for enabling evidence-based talent decisions to improve workforce and business outcomes. His group leads workforce research in a variety of areas, including attrition, retention, performance, compensation, talent development, engagement, innovation and organizational design. In this role, he oversees Johnson & Johnson’s employee survey strategy and is also responsible for managing a number of JNJ’s global compensation systems and processes. He has represented Johnson & Johnson in the Conference Board’s Human Capital Analytics Council, the Mayflower Group and is a member of the Board of Advisors of the Center for Workforce Analytics at Northeastern University. Prior to his current role, he provided strategic oversight of total rewards practices and programs for Johnson & Johnson North America. Doug has been with JNJ since 2005 and previously worked for GE in its commercial finance division. With GE, Doug worked in a variety of areas, including total rewards, market research and Six Sigma quality. Doug graduated from Western Michigan University with a bachelor’s degree in business and earned a master’s degree in business administration with a concentration in human resource management from Purdue University.

Gerald Diaz, Ph.D., is chief of the force management and enterprise readiness analysis division for the U.S. Air Force. He leads a team of 18 analysts performing Force (AF) Total Force human capital analyses. He develops strategic studies to build, shape, manage, develop, retain and support a diverse AF across all aspects of AF personnel life cycle analyses—recruiting, accessing, training and education, promoting, retaining, and developing. Jerry’s team conducts analysis of 506K Total Force Airmen engaged worldwide in contingency, peacekeeping and humanitarian operations. He has led strategic comprehensive personnel studies for the AF Total Force on the Military Retirement and Compensation Reform, linking military exit/retention surveys to personnel policies and programs, diversity and inclusion evaluations, female re-tention/pregnancy deferment/operations impact, and developing an Air Force Human Capital Analytic Strategy. Dr. Diaz is a 27-year veteran of the Air Force and has been the head of the department of mathematical sciences at the U.S. Air Force Academy, chief analyst for Air Force Studies and Analyses, a Fellow at the Homeland Security Institute, an editor for the Military Operations Research Society (MORS) Journal and a member of the MORS Board of Directors.

Mark Huselid, Ph.D., is the Distinguished Professor of Workforce Analytics and director of the Center for Workforce Analytics at the D’Amore-McKim School of Business at Northeastern University. His research, teaching and consulting activities are focused on the development of balanced measurement systems to reflect the contribution of the workforce,
workforce management systems and the HR management function to strategy execution and business success. Mark was the editor of the Human Resource Management Journal from 2000 to 2004 and is a current or former member of many academic and professional boards. The recipient of numerous awards for his research, he is among the most frequently cited scholars in the organizational sciences. He is also a frequent speaker to professional and academic audiences, having delivered over 600 presentations throughout the U.S., Europe, Africa and Asia. In addition, Mark has consulted on the topics of HR measurement and HR strategy with many companies around the world. Mark’s first two books, The HR Scorecard: Linking People, Strategy & Performance (with Brian Becker and Dave Ulrich, published in 2001 by the Harvard Business Press (HBP)), and The Workforce Scorecard: Managing Human Capital to Execute Strategy (with Brian Becker and Dick Beatty, published by the HBP in 2005), have been translated into 10 languages and are international bestsellers. His latest book, The Differentiated Workforce: Transforming Talent Into Strategic Impact (with Brian Becker and Dick Beatty), was published by the HBP in March 2009. Huselid’s new book, Disrupting Workforce Competition: Executing Strategy through Strategic Work, Workforce Differentiation, and Workforce Analytics, is currently in development.

Dawn Klinghoffer, a mathematician by background, joined Microsoft over 18 years ago, initially contributing to and subsequently now leading a team of 30 people. Her team has skills in statistics, psychology, finance and a whole host of other capabilities all underpinned by analytics, which Microsoft brings to bear in its HR Business Insight. “Microsoft is very data-driven,” Klinghoffer says, “so pretty much everyone wants to understand every type of aspect of our data, and that’s what our team specializes in.” Dawn’s responsibilities at Microsoft include advanced people analytics and research for Microsoft’s business units globally, analytics support for HR programs, global diversity & inclusion, global HR operations, reporting tools and technology for HR, and HR data privacy. Prior to Microsoft, Dawn was an actuary at leading insurance companies.

Alec Levenson, Ph.D., is an economist and senior research scientist at the Center for Effective Organizations, Marshall School of Business, University of Southern California. He is the author of the book Strategic Analytics. His action research and consulting work with companies optimize job and organization performance and HR systems through the application of organization design, job design, human capital analytics and strategic talent management. He has trained HR professionals from a broad range of Fortune 500 and Global 500 companies in the application of human capital analytics. Alec’s research has been featured in numerous academic and business publications, and in the New York Times, Wall Street Journal, The Economist, CNN, Associated Press, U.S. News and World Report, National Public Radio, Los Angeles Times, USA Today, Marketplace, Fox News, and many other news outlets. Alec has received research grants from the Sloan Foundation, Russell Sage Foundation, Rockefeller Foundation, U.S. National Science Foundation, China National Science Foundation and National Institute for Literacy. He is on the editorial boards of Human Resource Management and Small Business Economics. He received his Ph.D. and M.A. in economics from Princeton University, specializing in labor economics and development economics, and his B.A. in economics and Chinese language (double major) from University of Wisconsin-Madison.

Mark Rivera, Ph.D., works as a product manager on the People Analytics Team at Google, where he uses research methodologies from sociology, social psychology and machine learning to develop products that users find engaging and personalized. He earned his Ph.D. from the Kellogg School of Management and he holds a graduate certificate in data mining and machine learning from Stanford University. Mark has taught classes on management, social networks and negotiations at the Kellogg School of Management and has consulted on the use of social network data at Zynga, Google, IDEO, Stanford School, Northwestern University and the Stanford Graduate School of Business.

Greta Roberts is the CEO and co-founder of Talent Analytics. She is an influential pioneer in the field of predictive workforce analytics where she creates solutions and dialogue between the predictive analytics and workforce communities. In recognition of her commitment and leadership, Greta was elected and continues to be Chair of Predictive Analytics World for Workforce, an innovative, annual predictive analytics event dedicated to solving workforce challenges. Since co-founding Talent Analytics in 2001, Greta has successfully established the firm as the recognized employee predictions leader, both pre- and post-hire, on the strength of its powerful predictive analytics approach and innovative Advisor™ software platform designed to solve complex employee attraction and performance challenges. Greta has a penchant for identifying strategic opportunities to innovate and stay ahead of the curve, as evident in the firm’s early direction to use predictive analytics to solve “line of business” challenges instead of “HR” challenges and model business outcomes instead of HR outcomes. Greta is a board member of the INFORMS Analytics Certification Board and a faculty member with the International Institute for Analytics (IIA).
William A. Schiemann, Ph.D., is principal and CEO of Metrus Group, an organizational research and advisory firm specializing in strategic performance measurement, organizational alignment and talent optimization. Dr. Schiemann and his firm are known for their pioneering work in the creation of the People Equity (ACE) talent optimization framework, strategic performance metrics and scorecards, the strategy mapping process, valuation of internal shared service functions, and for strategic employee surveys that drive high performance.

He has consulted extensively with many major corporations. Bill is a thought leader in the human resource field, authoring scores of articles and multiple books, including The Rise of HR (HRCI 2015), Hidden Drivers of Success: Leveraging Employee Insights for Strategic Advantage (SHRM 2013), The ACE Advantage: How Smart Companies Unleash Talent for Optimal Performance (SHRM 2012), Reinventing Talent Management: How to Maximize Performance in the New Marketplace (Wiley & SHRM 2009) and Bullseye! Hitting Your Strategic Targets Through High-Impact Measurement (Free Press 1999).

In addition to publication, Dr. Schiemann is a frequent global speaker for many public and private forums, including the American Society for Quality, Australia Human Resource Institute, Hong Kong Institute of HR Management, Human Resource Excellence Center (China), Human Resource Planning Society and the Society for Human Resource Management. Dr. Schiemann received a Ph.D. in organizational psychology from the University of Illinois, an MBA from the Stuart School at Illinois Institute of Technology and a B.S. in psychology from Illinois Institute of Technology.
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