Getting Students Ready for HR Analytics: Teaching HR as a Science

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Teaching HR Analytics

- Literacy
- Fluency
- Mastery
Teaching HR Analytics

Today we are focused here & here

- Literacy
- Fluency
- Mastery

Bauer & Caughlin
Outline

• Current State of HR Analytics

• Defining HR Analytics

• Training Students

• Future Directions
Current State of HR Analytics
Transforming the Workforce

Source: Kavanagh & Johnson (2018)
Transforming the Workforce

% of Time Spent on Activity

Transactional  Transformational

Source: Kavanagh & Johnson (2018)
Transforming the Workforce

Source: Kavanagh & Johnson (2018)
Transforming the Workforce

% of Time Spent on Activity

Automation

Requires new HR skills & knowledge

Transactional

Transformational

Source: Kavanagh & Johnson (2018)
The “Elbow” of HR Analytics

Source: Theemergingfuture.com via Bersin LinkedIn blog
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Current State of HR Analytics

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Current State of HR Analytics

- **85%** of surveyed companies rated HR analytics as “important” or “very important”
- **70%** of surveyed companies actively working toward integrating HR analytics into decision making
- **42%** of surveyed companies rated themselves as “ready” or “very ready” for the HR analytics trend

Defining HR Analytics
HR as a Science

Human Resources

Data-Informed Decision Making

HR Analytics
Defining HR Analytics

**HR Analytics**: process of collecting, analyzing, and reporting people-related data for the purpose of improving decision making, informing and supporting strategy, and sustaining a competitive advantage.

Related to other terms such as:
- People Analytics
- Human Capital Analytics
- Talent Analytics
- Workforce Analytics
- Industrial & Organizational Psychology
- Predictive Analytics
- Data Science

Bauer, Erdogan, Caughlin, & Truxillo (2019)
Opening Case

Strategic HRM in Context: The Case of Strategy and HR Analytics at Chevron

Chevron is a large energy company based in San Ramon, California. In 2014, the company launched a centralized human resource analytics team, which they refer to as a talent analytics team. Human resource (HR) analytics goes by different terms, such as people analytics, workforce analytics, human capital analytics, and talent analytics; it refers to the process of collecting, analyzing, and reporting people-related data for the purpose of improving decision making, achieving strategic objectives, and sustaining a competitive advantage.

Case discussion questions:

1. How has Chevron used HR analytics to inform and support organizational strategy?
2. Chevron's HR analytics team used statistical models to predict employee turnover with a high degree of accuracy. Based on your own knowledge and experiences, what are some key drivers (i.e., predictors) of employee turnover? Why?
3. What are some different ways in which an organization might leverage HR analytics to attract, motivate, and retain talented people?
4. Chevron has established an HR-specific analytics team. From the perspective of organizational effectiveness, what are some potential advantages of having data analytics integrated directly into the HR function as opposed to a company-wide analytics team that supports HR and other functional areas? Why?
Training Students
Fill HR Analytics Talent Gaps

Train students on:

• Core HR concepts, procedures, and systems
• Technical skills (e.g., statistics, mathematics)
• Information systems and technology
• Soft skills (e.g., communication, storytelling)
• Aligning HR objectives with business strategy
Fill HR Analytics Talent Gaps

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Integration of data analytics into existing jobs in HR and in the general business
HR Analytics Competencies

- Theory
- Business
- Data Management
- Measurement
- Statistics & Data Analysis
- Storytelling
- Ethics & Employment Law

Bauer, Erdogan, Caughlin, & Truxillo (2019)
Quantitative Skills Continuum

Zero Quant

Light Quant

Heavy Quant

Analytical Translator
HR Analytics Project Life Cycle

- Question Formulation
- Data Acquisition
- Data Management
- Data Analysis
- Data Interpretation & Storytelling
- Deployment & Implementation
Question Formulation:
Asking the Right Questions

Analytics for Analytics Sake

VS.

Purposeful Analytics
Step One: Identifying the Problem

Like any problem-solving approach, the first step of the scientific process is to identify and define the problem. That is, what specifically will you try to describe, predict, explain, or understand using analytics? For example, imagine your organization has been facing a retention issue, in which employees are voluntarily leaving the organization at a concerning rate. In general, turnover is a major cost for organizations, with some estimates suggesting that selecting and training a replacement employee can cost organizations between 50% and 200% of the first-year salary for each person who leaves the organization. Given the cost of voluntary turnover and your organization’s latest turnover rates (which represent a type of descriptive analytics), you might define voluntary turnover as a problem for which you wish to find a solution, as failure to do so might impair the organization’s ability to achieve strategic objectives.
Data Acquisition & Management: 
Acquiring Good Data

Data

Analysis

Interpretation & Communication

Bauer, Erdogan, Caughlin, & Truxillo (2019)
Data Acquisition & Management: Acquiring Good Data

Bauer, Erdogan, Caughlin, & Truxillo (2019)
Textbook Example: Data Cleaning
Background

Here are the definitions for the data fields in the Employee Data table:

- **Employee ID** (unique identifier for employee)
- **Last Name** (last name of employee)
- **First Name** (first name of employee)
- **Job Level** (level at which an employee’s current job is classified; can range from 1 [lowest] to 5 [highest])
- **Facility** (location of facility where employee currently works)
- **Hire Date** (hire date of employee)
- **Start Date** (first day of work for employee)
- **Onboarding Completed** (completion of new-employee onboarding training module; Yes = module completed, No = module not completed)
Step 1

Open the Excel workbook titled “Chapter 3 - Excel Extension.xlsx”.

Review the data fields in the table, and refer to the field definitions in the Background Section of this tutorial.

Note that each row below the column names represents a unique employee, where the total number of employees is 15.
Let’s begin by using the filter feature of Excel to determine whether the data within a field needs to be cleaned.

Select the Job Level field by clicking on the box containing the letter above that column, which in this case happens to be D.

Alternatively, you could select all of the columns to apply filters to all fields in the table.
Because we know that the Job Level field should have a minimum value of 1 and a maximum value of 5, we enter these values in the fields beneath Minimum: and Maximum:.

Click OK.
Data Analysis:
Continuum of Analytics

Descriptive Analytics
- Traditional HR metrics
- Data commonly reported in HR dashboards

Predictive Analytics
- Predictive modeling
- Simulations and computational modeling

Prescriptive Analytics
- Translation of predictive and computational modeling findings to actions and recommendations
Data Analysis:
Continuum of Analytics

EXAMPLE

Descriptive Analytics

Calculate voluntary turnover rate for the organization
Textbook Example: 
Turnover Rate
Step 1

Open the Excel workbook titled “Chapter 10 - Excel Extension.xlsx”.
You will use the data contained in the Tutorial sheet to learn how to calculate an annual turnover rate.
Note that these data represent the entire organization.
Step 6

The average number of employees for the year is approximately 1,241.17.
The annual turnover rate is 48.7%.
Data Analysis: Continuum of Analytics

EXAMPLE

Use equation derived from regression model to predict future applicants' job performance based on selection tool scores
Textbook Example: Selection Tool Validation
Step 1

Open the Excel workbook titled “Chapter 7 - Excel Extension.xlsx”.

Click on the sheet called Tutorial. You will use the data contained in this sheet to learn how to create a correlation matrix and a multiple linear regression model in Excel.

Note that the sheet includes four fields/columns/variables:

- **Proactivity** (productivity assessment; 1 = low proactivity, 15 = high proactivity)
- **Emotional Intelligence** (emotional intelligence inventory; 1 = low emotional intelligence, 10 = high emotional intelligence)
- **SJT** (situational judgment test; 1 = low SJT, 10 = high SJT)
- **Customer Service** (customer service job performance; 1 = low performance, 30 = high performance)

Note that there are 300 employees in this sample.
To specify our multiple linear regression model, in the Data Analysis window, select Regression.

Click OK.
Step 15

When the Regression window opens, in the field next to Input Y Range: enter the range of cells that contains our criterion variable (Customer Service) and associated values, including the variable labels. Next, in the field next to Input X Range: enter the range of cells that contains our predictor variables (Proactivity and SJT) and associated values, including the variable labels.

Check the box next to Labels.

Click the bubble next to New Worksheet Ply.

If you would like, next to New Worksheet Ply: type in what you would like to name the new sheet. Here, “Regression” is entered in the field.

Click OK.
In the Regression Statistics table, note that the R Square value is .264, which means that collectively the predictor variables in the model (Proactivity and SJT) explain 26.4% (.264 x 100) of the variance in the criterion (Customer Service). This may not seem like a large amount of variance explained, but this is actually quite good for a criterion-related validity study.
Data Acquisition, Management, & Analysis: Ethics & Legal Issues

Just because you can – should you?
**FIGURE 3.4 Data Visualization With Scatterplots**

The way in which data are presented using data visualizations can affect how the users interpret the data. Both scatterplots depict the same data; however, the x- and y-axis scaling for the scatterplot on the right is much larger, resulting in what appears to be a stronger relationship between Annual Sales and Variable Pay.
Spotlight on Legal Issues

Scraping Data Can Lead to Big Legal Trouble

In 2010, a software engineer in Colorado named Pete Warden developed and deployed a program designed to “crawl” publicly available Facebook pages. In no time, he had gathered data from 500 million Facebook pages from 220 million Facebook users. The data gathered were identifiable, as they included names, locations, friends, and interests. In the interest of research, Mr. Warden created an anonymized version of the dataset and offered it to others to use.

However, this was not the end of his story. As Mr. Warden is quoted as saying, “Big data? Cheap. Lawyers? Not so much.” Thus, in order to try to avoid legal problems with Facebook, he deleted all copies of his dataset and never made it public. Data scraped or crawled (automatically extracted using computer software programs) from websites are subject to three major legal claims against their collection, including copyright infringement, the Computer Fraud and Abuse Act, and terms-of-use violations, among others. Subsequent data privacy issues emerged when Cambridge Analytica gathered data from Facebook users. These breaches of trust led Facebook to rethink which data are gathered and how much control users have over what is shared about them. 

Textbook Example: Spotlight on Ethics

SPOTLIGHT ON ETHICS

Fitness Trackers and Data Privacy

Today, many organizations partner with vendors to address employee health and engagement. For example, with the goal of improving employee well-being for partnering organizations, Virgin Pulse provides employees with wearable devices and applications to track their sleep, stress, activity level, and other personal data. Companies like Virgin Pulse tout their commitment to data privacy, security, and compliance, thereby implying that employee data will not be shared in an unauthorized manner.

However, if an organization decided to provide employees with wearable devices instead of working through a third-party vendor like Virgin Pulse, this could pose an ethical dilemma under certain circumstances. Namely, without proper data privacy and compliance restrictions in place, the data could be used in ways that would compromise individuals’ privacy and other personal rights. Although perhaps not illegal, HR professionals may run dangerously close to committing discrimination under the Americans with Disabilities Act (ADA) if they use these data to make employment decisions. Poor or irregular sleep, for example, does not necessarily constitute a disability according to the ADA, but it could be an indicator of various physical diseases or psychiatric disorders, which are protected as disabilities under the ADA. Further, even if deemed legal, using employee health data in this manner could be construed as unethical, particularly if the data are used in a way that deviates from their intended use.

Questions

1. How does the use of a third-party vendor like Virgin Pulse make it more ethical to have employees wear monitoring devices than it would be if the employer did so directly?

2. Do you think the use of monitoring devices should be optional for employees? How would you ensure that employees who opted out of using the device would not be penalized for nonparticipation?
Data Interpretation & Storytelling: Tell the Story

Source: Amelia Pape
Textbook Example: Data Visualization
Open the Excel workbook titled “Chapter 11 - Excel Extension.xlsx”.

Click on the sheet called Tutorial. You will use the data contained in this sheet to learn how to calculate compa-ratios and create scatterplots in Excel.

Note that the sheet includes three fields/columns/variables:
- **EmployeeID** (unique employee identifier)
- **Tenure** (job tenure in years)
- **Compensation** (combined base and variable pay in US dollars)

Note that there are 521 customer service representatives in this sample.
Step 3

Calculate the compa-ratio for the first person.

Below the variable you labeled Compa-Ratio, type the = sign, and then reference the cell that contains the compensation value (C2) for that person. Divide by the pay range/grade midpoint, which is $55,000 for the Customer Service Representative job. Your formula should be: 

=\frac{\text{C2}}{55000}.
Each dot in the scatterplot represents an individual customer service representative in the sample. As you can see, most of the dots are clustered between 0.5 to 1.5 years of tenure in terms of the X-axis, which indicates that this is a “young” sample in terms of tenure.

Upon visual inspection, there does not seem to be any systematic relationship between Tenure and Compa-Ratio, which means that there does not appear to be evidence of systematic pay compression in this sample. That is, as Tenure increases in years, we don’t see Compa-Ratio moving systematically upward or downward.
Future Directions
Future of HR Analytics

Ethics

Wearables

Blockchain

Small and Medium Organizations
Outline

• Current State of HR Analytics
• Defining HR Analytics
• Training Students
• Future Directions
References

