People Analytics
MGMT 793X /OIDD 793X

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This course examines the use of data to improve how people are managed within organizations. People really are most organizations' most important asset, providing the critical link in converting strategy and capital into value. Yet throughout most of our history, most organizations have relied on long-standing traditions, hear-say, political expedience, prejudice and gut instinct to make decisions about how those people should be managed. Recent years have seen a growing movement to bring more science to how we manage people. In some cases, that means ensuring that whatever practices and approaches we adopt are backed up by solid evidence as to their effectiveness. Often, organizations will seek to go further, analyzing their own data to identify problems and learn what is working and what is not in their own context. This course applies the insights of the people analytics movement to help students become better managers and more critical analysts within their organizations.

The course aims to develop students in three specific ways. First, it will provide students with an up-to-the-minute grounding in current evidence about managing people, providing a knowledge base that can ensure that their future management is guided by best practices. Second, we will develop the skills and understanding necessary to be thoughtful, critical consumers of evidence on people management, allowing them to make the most of the analysis available to them as they make people decisions. Third, we will provide guidance and practice in conducting people analytics, preparing students to gather data of their own, and making them more skilled analysts.

We will pursue these goals through a mixture of lecture, case discussion, and hands on exploration of a variety of data sets.

Course Content.

The course will cover a wide variety of topics related to effectively people, including:

- Selecting the right people for the job
- Measuring and managing performance
- Increasing engagement and reducing attrition
- Understanding and managing informal communication networks and culture
- Using analytics to improve diversity and access to opportunity within the workforce

In tackling each of these topics, we will discuss existing evidence on best practices. We will also examine how analytical techniques can be applied to understanding these questions within organizations. Specifically, for each are of application we will discuss:

- What kinds of data and measures can provide insight into people questions
- What analytical techniques are most appropriate for deriving valid insights
- Legal, ethical and practical concerns around the use of analytics

Although this is not primarily a statistics or coding class, we will cover appropriate statistical techniques for analyzing various kinds of people data. We will also discuss how to use R to implement these techniques.

Prerequisites

Students should have taken MGMT 610 and either MGMT 611 or MGMT 612 prior to taking this class (undergraduates who have taken MGMT101 and MGMT104 will also be admitted). It is also necessary to have a solid grasp of the concept of statistical significance.

We will also use the statistical package R to work through example analyses in class. I chose R because it is an open-source package (ie free to download and use) and the most commonly used package for statistical analysis in business. Students are not required to be proficient in R in order to take this class, nor will they be required to learn R. Nonetheless, I strongly encourage students to invest in learning a little about this package, both to get the most out of this class, and to set them up to perform analysis in their later career.

Assignments and Grading

The grade will have three components:

Participation: 25%
Individual assignments: 45%
Class Project: 30%

Participation

The class will be highly participative. The goal is that we should all learn from one another. As a consequence, I expect active participation from everyone and will grade accordingly. Attendance will be a major component of the participation grade, and **repeated unexcused absences will be grounds for failing the class.**

Individual Assignments

There will be three individual assignments, each worth 15%. In each case, you will be provided with some data and a short question to answer by studying the data. A 1-2 page write-up of your answer will be due before class, allowing us to discuss your answers during class. Late submission will not, therefore, be permitted.

The assignments are designed so that they can be conducted with a variety of analytical tools and methods, including both Excel and R. We will provide example R code to help you get started, but students who are uncomfortable with R can complete the assignments using Excel.

The assignments are also designed so that there is no single correct answer. Instead, we want to see what insights you can gain from the data. Each assignment will be graded on a check minus, check, check plus, check double plus basis, with the grade reflecting the rigor and depth of your answer.

Team Project

The team project is designed as a class consulting exercise for a real organization facing a real people problem. Teams should comprise of 5 people. You will be provided a dataset in session **, as well as a description of the company's challenge. All teams will be studying the same company and issues. Your task is to analyze the data and provide a set of recommendations to the company based on your analysis. There will be three deliverables for the project:

1. A 10 page report, due on the last day of class. The report should detail:
   a. How you analyzed the data. For example, did you look at all of the data or did you choose to ignore certain observations? What measures did you calculate to help you answer the organizations' question? What analyses did you perform?
   b. Your findings. What were the results of your analyses? How much confidence (statistical and otherwise) do you have in them? What limitations should we bear in mind?
   c. Your recommendations. What actions do you think that the client organization should take, based on your analyses.
2. A 7 slide presentation to be made to the client. This presentation is due **2 days before the last class**. We will review the slides and pick 4 teams to present their solutions. We will choose based both on the quality of the presentations, and to provide a range of different approaches in class. Those teams that are selected will present in front of the class and a representative from the client organization.
3. An accounting of who did what. You should submit a table that describes which of your team members worked on which parts of the project. Specifically, for each of the major components of the project (data management, analysis, recommendations, report writing, presentation writing), please provide a rough %age of the work done by each team member.

Course Outline

Session 1: Introduction to People Analytics

What is People Analytics? How can careful analysis improve the way that we manage people? What are organizations doing to make the best use of such analysis? And what will you need to know about that analytics in your job? In this session, we will introduce some of the core themes of the class, describing the uses of people analytics as well as some of the concerns.

Readings
- "Susan Cassidy" – HBS case
- Garvin (2013) "How Google Sold its Engineers on Management", *Harvard Business Review*

Questions
- What surprises you about the findings of Google's Project Oxygen? Do you think that they could have reached the same conclusions in other ways?
- Which candidate should Susan Cassidy choose and why? Is there more information that you would like to know if you were her?

Session 2: Hiring and Analytics, Part 1

Perhaps the single most common use of analytics in managing people is to optimize hiring, making sure that you are hiring the right employees for the right roles. In this first session on the topic, we will discuss the reasons why analytics is important in hiring and describe in detail the best practices for managing an evidence-based hiring process.

Readings:

Bock, Lazlo (2015) *"Work Rules"* Chapter 4.

Aaron Chalfin, Oren Danieli, Andrew Hillis, Zubin Jelveh, Michael Luca, Jens Ludwig and Sendhil Mullainathan (2016) "Productivity and Selection of Human Capital with Machine Learning." *American Economic Review: Papers and Proceedings 106(5): 124-127*

Questions:

- How does the Google hiring process differ from the way that you were last hired?
- What do you see as the strengths and weaknesses of how they hire people?

Session 3: Hiring and Analytics, Part 2

In this session, we get into the mechanics of using data to predict who to hire. We will discuss how to analyze the data to understand who performs best in the job. We will also discuss various possible problems that might be encountered in predicting who will perform best, and strategies for dealing with them. By the end of this session, you should feel more confident performing multi-variate analyses. You should also know what questions you need to ask of any data-based selection process in order to ensure that it is valid, legal and ethical.

Assignment 1 Due Before Class!

You will be provided with two datasets. The first dataset describes the characteristic and performance of a set of former and current employees. The second dataset provides characteristics of a set of applicants. Your assignment is to analyze the data and answer the following questions (your submission should be 1-2 pages, single spaced):

1. Which three applicants would you recommend that the company hire?
2. What formula, algorithm or heuristic did you use to pick these three applicants, and how did you arrive at this approach?
3. What concerns or caveats do you have about your recommendations?

Session 4: Performance Assessment

Performance assessment is at the heart of any people management process. Not only does the assessment inform how we rewards people and assign people to jobs; it is also a vital input into any analysis that we might want to do to understand why people perform well and others perform poorly. At the same time, accurate performance assessment is surprisingly difficult in many roles. In this session, we will discuss various approaches to measuring performance to identify the best way to assess performance in a given role.

Readings:
- "Dovernet" HBS Case study

Optional:

- Cappelli and Conyon (2018) "What Do Performance Appraisals Do?" *Industrial and Labor Relations Review*

Questions
- What do you think of the performance management system at Dovernet? What are its strengths and weaknesses? What recommendations would you have for improving it?
- What should Kristina Chung do about Trent Raynor and Gwen Davidson?

Session 5: Guest Speaker Panel

In this session we will bring in a couple of speakers who use people analytics in their day to day work. We will talk to them about the kinds of work that are most valuable in delivering insights to change what people do, what they have learned from their experiences, and the biggest challenges that they have faced.

Session 6: Happiness and Engagement

How we manage people shapes how they feel about us, their job, our organization, their lives. Managing them effectively is therefore both important for organizational performance and for their own well-being. But what is likely to improve our employees' emotional well-being? And how do we assess how they are feeling? These are questions that organizations invest substantial time and effort in addressing.

In this session, we will discuss the state of existing knowledge on what drives happiness and engagement in the workplace. We will then cover different techniques for tracking employee engagement. We will focus in particular on developing effective surveys to understand how employees are feeling.

Readings:
- Sigal Barsade and Donald Gibson (2007) "Why Does Affect Matter in Organizations?" *Academy of Management Perspectives*

Questions:
- Why should employers worry about how their employees feel?
- What can employers do to shape their employees' affect?
- How can an employer know what their employees are feeling?

Session 7: Attrition, Part 1

Attrition is the reverse of hiring; just as organizations need to make sure that they are hiring the right people, so they also need to ensure that the right people stay with the organization. Managing attrition is therefore another major focus area of people analytics.

In this first session we will explore the implications of attrition for organizations, as well as discussing evidence on what drives people to leave companies

Readings:
Store 24 Case (HBS Case study)

Assignment 2: Due in Class Today!

Prepare a 2 page memo for Bob Gordon, answering his questions. In particular:

1. Is there a relationship between manager and crew tenure and store profitability?
2. Can you estimate how much more profitable stores are when they have one month longer crew tenure and one month longer manager tenure, on average?
3. How important is site tenure relative to site location in explaining store profitability?
4. Can you find any evidence that the value of increasing tenure is more important in stores that start off with very low levels of tenure? In other words, is there any evidence of a non-linear effect of tenure on financial performance?
5. The CEO wants to decide whether to prioritize raising manager tenure or crew tenure. What would you recommend?

Be clear about what you have concluded about the impact of turnover on performance and how you have derived your conclusion.

The data necessary to answer this question can be found on Canvas. Sample R programs are also posted there.

Session 8: Attrition, Part 2

In this session we will discuss how companies use analytics to better understand the drivers of turnover, and some of the ways that such analysis can help to improve how people are managed. We will also explore the use of "survival" models for better analyzing such time-dependent processes.

We will do an in-class exercise. Please bring your laptop!

Readings:
David Allen, Philip Bryant and James Vardaman (2010) "Retaining Talent: Replacing Misconceptions with Evidence-Based Strategies" *Academy of Management Perspectives*

Optional:

Paul Allison (2014) *Event History and Survival Analysis.* Sage. Available online from the library at
http://proxy.library.upenn.edu:2155/10.4135/9781452270029

Questions:
You are tasked by your CEO with figuring out how to reduce turnover in the organization.

- What kind of analysis might you conduct to figure out what to do?
- What data would you collect?
- How would you analyze it? What particular challenges might turnover data create?

Session 9: What Works? Program Evaluation

Getting the most out of your people can involve substantial investments of time and money. But which of those investments are paying off? Without being able to assess the effectiveness of management practices, there is a risk that you spend too much on things that provide little return – or too little on things that really work.

In this session, we will explore the challenges of accurately assessing the benefits of any given practice. We will begin by reviewing what we know about the kinds of management practices that tend to create value. We will then go on to discuss different approaches to measuring the effects of practices, with the goal of understanding how best to understand what benefits workers and the organization.

Readings:
Martin Edwards and Kirsten Edwards (2016) *Predictive HR Analytics: Mastering the HR Metric.* Chapter 9: Case study 6. Monitoring the Impact of Interventions, pages 319-325

Questions:
- What do you see as the main challenges in finding out what works within organizations?
- If you were to design an experiment to test whether an intervention works, what should you bear in mind?

Session 10: Analyzing Social Networks Part 1

Work is fundamentally a collaborative exercise, as we combine efforts with our colleagues to build the business. Getting those collaborations right is therefore critical to organizational effectiveness. Social Network Analysis allows organizations to measure that collaboration as a prelude to identifying and addressing opportunities for improvement.

In this session we will study how network analysis is being used within organizations, covering the kinds of data that can be used to track collaboration within the organization and the kinds of problems that network analyses can be used to solve.

Readings:
"Troubled Spain" – Universidad de los Andes case

Michael Arena, Rob Cross, Jonathan Sims and Mary Uhl-Bien (2017) "How to Catalyze Innovation in Your Organization. *Sloan Management Review*

Optional:

Rob Cross, Stephen Borgatti, Andrew Parker (2002). "Making Invisible Work Visible." *California Management Review*

Questions:
- What actions should James Reid take to improve the functioning of Troubled Spain?

- What can we learn from the network study? How would it inform your opinions about what James should do?

Session 11: Analyzing Social Networks, Part 2
In this session we will explore the details of network analytics to give a deeper insight into how to use and interpret network data.

Assignment 3. Due in Class Today!
We will provide you with data on communication patterns within Netcorp, a small, three department company. We will also provide you with an R program that can be used to analyze the data (you may also complete the exercise using Excel if you prefer).

Based on the data, please answer the following questions that have been posed to you by the CEO:

1. I worry that my three departments are not talking to one another. Is that true? How would you evaluate the quality of interaction across the departments?
2. Our sales department seems to be very slow at making decisions and that has led us to lose a certain amount of business. Why do you think that is?
3. We have been considering using retention bonuses to make sure that we hold on to key people within the organization. Can you use your analysis to recommend anybody for them?

As ever, please explain your answers. Assignments should be between 1 and 3 pages long.

Session 12: Measuring Culture
Managers love to say that "Culture eats strategy for breakfast." But they also love to say that "What gets measured gets managed." So how do you measure culture?

Although most discussions of culture are highly impressionistic, advances in theory and machine learning are producing many different ways to measure culture, and thereby influence it. In this session, we will go into depth on what culture means, how it can be measured, and what we can do once we measure it. A particular focus will be on understanding the latest approaches to analyzing language, and how they can be used within organizations.

Readings:
"When Cultures Intersect: The Merger of Bear Stearns and JP Morgan" – Wharton Case Study

Boris Groysberg, Jeremiah Lee, Jesse Price and J. Yo-Jud Cheng (2018) "The Leader's Guide to Corporate Culture" *Harvard Business Review*

Questions:
1. Do you think that differences between the culture of Bear Stearns and JP Morgan affected the success of the merger?
2. Suppose that you were asked to assess these differences. How would you measure them?
3. What value do you think that measuring culture would create? What would it allow you to do?

Session 13: Diversity Analytics

Managing diversity has become one of the most important human capital topics in recent years, and is an important area of boardroom focus. Achieving diversity is important for driving business goals through increased innovation and understanding of a broad array of customers; it is important to managing the organization's reputation; and it deals with basic ethical issues for managers and organizations.

Effectively managing diversity requires effective analytics, both to effectively measure where the organization stands on diversity and equity, and to identify and assess the most effective interventions to improve diversity.

In this session, we will discuss different approaches to measuring diversity and what we can learn from them. We will also explore how data is used to identify why organizations lack diversity, and discuss the practices that seem to improve diversity.

Readings:

"Eliminating the Gender Pay Gap: Gap Inc Leads the Way." Berkeley Haas Case

Price Waterhouse Coopers (2018) "On Air Review"

Questions:

- Of the various measures that Gap could use to assess pay equity, which do you think that they should rely on?
- What factors do you think have been most important in allowing Gap to achieve pay equity? What could other organizations learn from them?
- How would you assess PwC's analysis of pay levels at the BBC. Do you think that their conclusions are valid?

Session 14: The Law and Ethics of People Analytics

The use of people analytics has profound implications for applicants, employees and organizations. Many of the issues that we worry about within the context of the employment relationship, such as discrimination, coercion and privacy, are exacerbated by the capacity to monitor employees non-stop and implement consistent decisions across a workforce. As a consequence, legal and ethical issues come up repeatedly in the practice of people analytics. As a people analytics practitioner, it is important to understand the boundaries around what you legally can and ethically should do. As an employee and a citizen, you need to be aware of how your data is being used and what you can do about it. We will discuss those issues in this session.

Readings:

Cathy O'Neil (2017) "Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy", Chapter 7

Questions:

- Do you think algorithms can be more damaging than human judgment in managing people?
- What features of algorithms and measures make them particularly dangerous in the workplace?
- What guidelines would you implement around how algorithms should and should not be used in managing people?

Session 15: Project Presentations

In this session, four teams will be chosen to present their project findings. We will debrief the project and the overall course.