# **Advanced Applications** of People Analytics

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Handbook of Graphs and Networks in People Analytics With Examples in R and Python



#### **People Analytics Maturity Staircase 5** Reliable predictions 4 Advanced analytics of key decisions capabilities (data through data and 2 Good data but **3** Strong data, science, statistics analytics challenging for accessible and expertise) decision-makers to available access/analyze it **Poor data** Capabilities Transactional data Technology for Advanced analytics • "Very big data" – high required disseminating specialists (data volume and high entry systems reliability analytics (eg scientists, statisticians) Central data repository reporting platforms) Advanced statistical and controls Deep expertise in Dedicated analytics predictive analytics (eq tools (R, Python, SAS) Basic rules for data Machine Learning) professionals collection Culture/ Data are the foundation Decisions Decisions supported by Analytics informs and • • Mindset a sophisticated enhances human of an analytical throughout the mathematical required approach organization are judgment and drives supported by data understanding of the automation Successful analytics and analytics problem requires consistent and Risk of algorithmic bias Data-driven approach is is understood and can structured data Decision-makers take a data-driven highly trusted be managed approach

# **Example: Advanced Network Analysis in Organizational Redesign**

- McKinsey US traditionally organized into five regional geographic offices (South, Midwest, Northeast, Mid-Atlantic, West Coast)
- These created layers of administration and made staffing of talent more complicated
- Questions:
  - What are the primary drivers of collaboration in the organization?
  - Should we maintain a regional organization?

 Created large network graph using electronic interaction records (email and calendar)

- Used a community detection algorithm to find closely connected sub-communities
- Determined that communities were not driven by geography, but by industry served
- Used visualization methods to demonstrate community structure
- Resulted in a decision to merge all regional offices into a single United States office

# Example: Topic Modeling in understanding large quantities of text documents

- A weekly 'Pulse survey' was instituted across a large organization at the beginning of the Covid pandemic to better track employee sentiment and wellness
- Thousands of text comments every week were submitted by employees
- Question: Is there a way to understand
  - The common topics being raised by employees
  - The sentiment of the language associated with each topic
  - How are these changing over time?



'Bubble size represents frequency of the topic. Connected topics were more likely to appear together in respondents' comments. Source: Weekly pulse surveys of ~10,000 employees of one global company from April 1 to May 27, 2020

# Example: Advanced statistical 'cluster' analysis in better understanding employee characteristics

		Women without sponsors (N = 143)		Junior employees losing momentum (N = 251)		Diverse and dissatisfied (N = 160)		Content high-performers (N = 166)		Average for those who received promotion (N = 331)		
	Individuals' features	Tenure (yrs)	9.8		6.7		8.1		6.8		6.4	
		Band	80% Managers		85% Professionals		83% Professionals		83% Professionals		73% Professionals	
		Time in grade (yrs)	5.8		5.0		6.1		4.8		5.1	
		Believes company is inclusive <sup>1</sup>	3.8		4.1		2.6		4.9		3.9	
		Gender, % female	69%		56%		61%		40%		52%	
		Ethnic group	White Hispanic/Latino African-American Asian	:73% : 9% : 1% :15%	White Hispanic/Latino African-American Asian	: 68% : 9% : 1% : 19%	White Hispanic/Latino African-American Asian	: 59% : 11% : 4% : 23%	White Hispanic/Latino African-American Asian	: 77% : 8% : 2% : 12%	White Hispanic/Latino African-American Asian	: 66% : 8% : 2% : 21%
		Business unit	R&D Manufacturing Commercial Corporate	:55% : 8% :15% :22%	R&D Manufacturing Commercial Corporate	: 51% : 24% : 13% : 12%	R&D Manufacturing Commercial Corporate	: 51% : 23% : 10% : 16%	R&D Manufacturing Commercial Corporate	: 40% : 18% : 30% : 11%	R&D Manufacturing Commercial Corporate	: 48% : 21% : 11% : 20%
	Individuals' environments	Manager capability	4.0		3.9		3.7		4.6		4.0	
		Inconsistent manager	64%		32%		39%		29%		39%	
	Individuals' behaviors	Rating	8.4		7.7		7.9		8.2		8.1	
		Involved in affinity groups	67%		28%		42%		22%		40%	
		Description	Tenured women in non- Manufacturing with great ratings and who participate in affinity groups, but with inconsistent managers		Employees lower in the organization with lower ratings		Diverse talent with more time in grade and dissatisfied with inclusiveness at company		Predominantly white males with a large concentration in Sales who are happy with their manager, believe in an inclusive company, and have great ratings			

1. Based on answer to engagement survey question around perception of equal opportunity on scale of 1 - 5

# **Example: Predictive manager alerts in helping struggling teams**

Manager alerts combine pulse survey results and other data to surface possible issues or concerns at the team level.

#### Manager alert tool, illustrative



#### Data inputs

- Pulse survey sentiment and trends
- Pulse survey free-text comments
- Metadata and digital exhaust<sup>1</sup>



#### Algorithm

- Combined at team level
- Teams with concerns identified



#### Output

- Alert team managers via email
- Team managers given access to tools
  to facilitate focused team discussions

Process repeats every 2 weeks

<sup>1</sup> "Digital exhaust" refers to the residue—information or data—that internet users may leave behind through their use of various applications.

### **Suggestions for further reading**





**Continuous Employee Listening** *Damonte, Ledet, Morales, Tobey 2023* 



**Using Data in Organizations** Chapter 4 of Data Methods and Theory in the Organizational Sciences *Fink, McNulty 2022*