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Human Capital Analytics

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Human Capital Analytics

How to Harness the Potential of Your Organization's Greatest Asset

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I want to thank my parents for their lifelong love and for teaching me the value of sticking to it, in spite of the obstacles; my incredible wife, Pamela, and daughters, Tiffany and Heather, who inspire me daily; and my sister, Susan, and brothers, Jeff and Scott, for their constant support. My longtime buddies Manny, Dennis, and Jeff, thank you for your friendship.

—Gene Pease

■ ■ ■

I'd like to thank my family for giving what I needed to do this all in the first place: my parents, who taught me the value of hard work and perseverance; my sisters, Marilynn, who led the way in turning dreams into books, and Joni, who has always been a pillar of support; and my sons, Cameron, Blake, and Alexei, who inspire me, bring out the best in me, and give me a reason to do big things.

—Boyce Byerly

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I thank the many people who had the foresight and courage to support me along the trail. Without their encouragement I probably would have given up the quest. Most important to me was Bob Coon, my best friend and golf buddy. We worked together on measurement at Four-Phase Systems in the late 1970s, and later he followed me and became president of Saratoga Institute. Thanks, Robert.

—Jac Fitz-enz

Contents

Preface

The value proposition that an enterprise has created has shifted. The value of a modern company is in the intangibles, most of which are human capital of one form or another: expertise, customer relationships, employer brand, intellectual property, and business processes. The companies that will thrive and prosper are those that get the most out of their human capital, and that requires they understand what is going on with their workforce, how investments affect it, and how to communicate those changes effectively with all parts of the enterprise. The human resources industry is just beginning to grasp the value of understanding its human capital and evolving from a shepherd's role to one that can bring change and add significant strategic value.

There has been quite a bit written recently about big data and the power of analytics. Yet not much has been written on predictive analytics and even less on human capital predictive analytics. Rigorous analysis that provides true impact and shows organizations how to optimize their human capital investments through predictive analytics is necessary for organizations to outperform their competitors in today's competitive environment.

Building on the work of Jac and his HCM:21 model (Human Capital Metrics for the 21st Century) and applying advanced statistical methodology, coupled with today's computing power, we felt the need to write a book that showed how to accomplish the holy grail of human capital analysis: predictive analytics. The book starts with an overview of human capital analytics and then imparts the major lessons we have learned from many years doing this work. The early chapters focus on how to get organized, with subjects such as alignment and a measurement plan and the organization of data sources. The middle discusses metrics in organizations, how they are organized, and what is useful in dashboards, descriptive statistics, and correlations. The last chapters

highlight what we call optimization, how to get beyond business impact and ROI to predictive analytics, and how to present the findings to effect organizational change. Each chapter is accompanied by a case study from a world-leading company that illustrates the chapter topic to show how our lessons are applied in complicated environments.

We hope this book will be read by both the leaders of human resources, as well as their associates outside of HR. We believe it will inspire you to apply the same tools used to evaluate and improve finance, marketing, and operations investments with the same rigor to human capital investments. We also hope to show HR practitioners that the lessons learned in this book and lots of hard work will result in their achieving significant improvement in their deployment of human capital investments and will ultimately drive organizational strategic goals.

Acknowledgments

The work that is represented in this book is the result of tireless collaboration for seven years of an amazing team at Capital Analytics and decades of Dr. Jac's work. It was a long time in coming, and a lot of people helped along the way. We would not be here today without the support of the Capital Analytics investors: Phil Buchanan, PhD; Barrie Trinkle; Joan Troy Ontjes, PhD; Dr. Andy Collins and Joey Colclough; and later on Reed Clevenger, Chris Hens, and Mike Wood. Thank you to our advisory board members, whose wisdom has helped us immensely: Sandy Costa; Steve Bistritz, PhD; Karen Jackson; Julia Gometz; Harold Stolovitch, PhD; Dean Spitzer, PhD; Diane Paces-Wiles; David Vance, PhD; and Hugh Wrigley.

After we put together the company with the help of the investors, we needed someone who completely understood the mind of the client. Bonnie Beresford was our client on the Chrysler projects and pushed us harder and drove us to better work than any client ever had. When we were ready to expand, she was the perfect choice to lead our client engagements and continues to be the person who understands how to realize value for the clients more than anyone else. (We were kind of hoping that once we hired her, she wouldn't work us quite as hard, but alas, we should have seen that one coming.) The team that has joined us at Capital is really our dream team, and we would not trade them for anybody. Melissa Lewis; Lori Ches; Jenny Murnane, PhD; and John Zonneveld have contributed brilliantly, with tireless late nights, passion, and creativity.

Before Capital Analytics, Boyce collaborated with David Hadden around the problem of measuring the return on investment on corporate training as merely a peripheral aspect of a skill gap analysis and management software tool. That "peripheral aspect" has spun into the current work on the broader topic of measurement of human capital. A lot of people contributed to that development. Eliot Cramer at UNC

knew how general linear models *worked*, all the way down to the nuts and bolts. Victor Lewis and Craig Anderson built an elegant early solution in software. Cami Kinahan helped us understand how to build a relationship with a client. Michael Chevalier put in long hours as a first-rate researcher. Karie Willyerd was one of our greatest and earliest evangelists while at Sun and served on our first advisory board. Susan Knox and Roland Smith contributed to the relationships and business savvy that helped turn a dream into a reality.

We would also like to acknowledge and thank our continued strategic partnership with Bellevue University, Bellevue University's Human Capital Lab, and its PhD program: specifically, President Mary Hawkins, PhD; Executive Vice President Michael Echols, PhD; and PhD Program Manager Jennifer Moss, PhD. Mike's vision and tenacity have transformed Bellevue into a world-class thought leader on human capital optimization.

We want to thank the clients who have trusted us to go inside the deepest recesses of their companies and shared their stories, their missions, and their data with us and let us be a part of it. Without them, we couldn't have developed the methodology that forms this book. The professional community in our field, especially the members of ISPI, could have felt like competitors but chose to be colleagues, advisers, and inspirations instead. We wish to thank the executives at each of our case study companies for allowing us to share their stories: Cedric T. Coco and Carmen Neudorff of Lowe's; Dr. Fiona Jamison and Dr. Heather Black of Spring International; Hogo Bague, Bob Farrell, and Mike Sokol of Rio Tinto; Mary Morand and Debbie Mandell of U.S. Bank; Mark Engelsdorfer and Fred DePerez of Chrysler; Ron Lawrence and Ruth Kennedy of VF; and Lucy Dinwiddie (now at GE) and John Hine of ConAgra Foods.

The crunch that went into writing the book in 2012 required a lot of labor. We especially want to thank Sara Jensen and Mia Heckendorf for their editing and keeping the authors on schedule, as well as Olivia Parr-Rud for her assistance with the final internal edit. In addition, we wish to thank our editor at John Wiley & Sons, Sheck Cho, for being such a pleasure to work with. We want to thank the Wiley editorial team, particularly Stacey Rivera, who reviewed every chapter and offered substantial feedback.

And thank you, SAS Institute, for supporting this project.

Introduction

Realizing the Dream: From Nuisance to Necessity

Personnel and Training are in the annex. We put them where they can't hurt anyone."

That was the direction I received on a beautiful September morning in 1969 when I walked into the headquarters of Wells Fargo Bank in San Francisco. I arrived for my new position in the training department. Naturally, I went to the great granite edifice that housed the main branch and many floors of offices at 464 California Street. Much to my surprise, I was directed to the annex four blocks away. As I walked two blocks east and two blocks north, I wondered, "Why am I going to the annex when most of my customers, managers, and employees are in the main building?"

This stunning experience started me dreaming. It eventually brought me to the work of Gene Pease and Boyce Byerly, the coauthors of this book. About 10 years ago, Boyce initiated the groundwork to develop the methodology and analytical tools that form the core intellectual assets of Capital Analytics today. The work began with applying statistical analysis to training investments. It drifted into HR, as clients began to request the application of predictive analytics to

increasingly complex investments. A few years later, I learned about Boyce's business partner Gene and their work at Capital Analytics, where they were applying statistical analysis to a broad range of human capital issues. Eventually, I invited Gene to speak at the Human Capital Metrics conference I run each year for the Conference Board. Gene and I decided that our approaches were complementary and agreed to coauthor this book with Boyce.

STARTING FROM THE BACK ROW

Prior to the Wells Fargo job, my career had been mostly in line jobs and sales. These were highly valued functions. Now I was about to join a unit that clearly was held in low regard within the bank. It didn't take very long for me to learn why this was the case.

Bankers live on numbers. They count success in quantitative terms, such as revenue and profits, while monitoring and recording it in instruments such as income statements and balance sheets. In 1969, these were foreign concepts for the personnel and training (P&T) folks. They liked people. The only counting they did was how many people the bank employed. The thoughts of cost or value were disregarded in favor of concerns about employee satisfaction. In my mind, the P&T people just wanted bank employees to be happy. The bank's management wanted employees to be happy, too—but more important, they wanted them to be contributing value that could be counted objectively and quantitatively.

THE VALUE DREAM

As strange as P&T's attitude seems now, it was not that unusual in 1969. At that time, most people in those functions across industries and indeed across countries shared the same happiness mentality. I was working on my master's degree at night in the early 1970s. One assignment was to design a job description for a job that did not exist at that time. Based on my experience at Wells and with other personnel types, I designed a job titled "Organizational Hugger." Its primary purpose was to make employees happy.

Fortunately, in the 1960s and1970s there were some dreamers who hoped for the day when the stigma of P&T would be replaced by an appreciation for the business value that the function contributed. A couple of brave but obscure proponents of the value dream started to publish isolated case studies of value added though training. Way back in 1954, Don Kirkpatrick wrote his doctoral dissertation on evaluating employee relations programs. In the 1960s, his dissertation found its way into the *ASTD Journal* and spawned his now famous "Four Levels of Evaluation." Conversely, this was followed by a speaker at ASTD's national training conference who stated emphatically that the value of training could not be determined.

After a year of struggling with my colleagues at Wells Fargo, I wrote a piece for the *Personnel Journal* titled "The Measurement Imperative."[1] Published in 1971, this was the first of more than 350 articles and a dozen books I've authored around this topic. In 1976, Ray Killian of Belk Department Stores published the groundbreaking *Human Resources: An ROI Approach*.[2] Its message fell on deaf ears. At about the same time Jack Phillips, later the founder of the ROI Institute, wrote his first of a steady stream of articles and books on training evaluation.

In 1980, after Motorola bought the computer company where I was head of HR, I decided it was time to commit myself totally to the dream. Accordingly, I founded Saratoga Institute and began researching and providing training on the human resources metrics we had developed in the computer company. Initially, the approach was mostly defensive. We had to show that HR was not an expense unit. It was a function that had the potential to add value on both sides of the income statement: revenue growth and expense reduction. We developed a set of metrics that HR people could use to communicate. In the late 1980s, when we launched the benchmark Human Resources Effectiveness Reports, the Society of Human Resource Management (SHRM) provided some initial funding. However, SHRM refused to recommend these metrics as the standard. Almost 30 years later, SHRM organized an effort to establish standard metrics. Interestingly, many of these metrics were derivatives of the 1980s program.

For a long time, no other thought leaders emerged. Then, in the 1990s, Mark Huselid began publishing annual survey data that

established the links between human resources investments and company productivity. Shortly thereafter, John Boudreau began writing on the connections between people and business results. Around 2006, Laurie Bassi began publishing her research on the connection of human capital investments to financial returns and stock prices. Most recently, Davenport and Harris's books on analytics have captured the attention of many in human resources. Now, we have reached a point where every issue of human resource and training magazines carries pieces on analytics. Finally, it seems that human capital analytics is crossing the threshold and gaining credibility within human resources department operations.

BARRIERS IN THE HUMAN RESOURCE AREA

Early attempts to promote the analytics dream stirred imaginations but garnered little commitment. Instead, we encountered a mixture of apathy and hostility. The strong prevailing attitude was that people should simply be accepted as valuable and no attempt should be made to apply numbers to their performance. Some said it would dehumanize them. Unfortunately, accounting systems have always treated employee investments as expenses. Absent a countering systemic view, employees will continue to be relegated to the expense column on the income statement, rather than a valuable asset on the balance sheet.

ORGANIZATIONS ARE ALL ABOUT PEOPLE, NOT THINGS

Organizations are composed of things owned or rented, such as equipment, material, money, and facilities. Organizations also consist of things that are not owned or rented, their people. Of the two groups, only one is active—the people. All other variables are passive and inert. Without people, all of those assets do little more than depreciate. Even cash, if not invested through some human act, will depreciate in value through inexorable inflation. The finest computer, vehicle, building, codified process, or pile of inventory cannot add value without human application. Still, management persists in spending millions to acquire

things such as new computers but refuses to invest in the training of employees to leverage the computer's capabilities.

Consider the example of one of my sons, who worked in a major retailer. At one point, the company invested in new cash register software. After installation, when the salesclerks asked how to run the software, they were told bluntly, "Read the manual." The end result was many errors, impatient customers, and lost sales until, through multiple trials, the clerks learned the system. During the course of this period of frustration and error, the frustrated clerks rang up any sales figure they could get (always less than the tag price) just to finish the transaction.

MANAGING RISK

The market is a cauldron of risk. Competition, government regulations, customers, technology, and employees are all high-risk issues today. Change is so rapid and radical that management is like a lottery. Managers place their bets and hope they made the right decision. Exacerbating that is the fact that managers are human. We are all flawed, no matter what our level of education or experience. In fact, without insight and objectively obtained data, experience can be a powerful enemy. What people have learned on the way up is often obsolete. The pressure to perform forces people to make decisions based on yesterday's events. Yet as powerful as they may have been, those past occurrences are not necessarily applicable to tomorrow's investment choices. This is precisely why we need analytics. Being bias free, analytic methods override human error in uncovering the hidden truths about a situation.

Descriptive, predictive, and prescriptive analytics allow us to do what I labeled "Manage tomorrow, today." Looking back descriptively through return on investment evaluations, we can learn why something happened the way it did. We can stop blaming people who can't defend themselves, which we do when we can't otherwise explain why things happen. After description, predictive analysis can show us a path that substantially raises the probability of future success. Prescriptive analysis shows us how to be successful tomorrow. The

likelihood of success increases through consistent, error-free performance supported by solid analytic methodology.

HISTORIC FUNDAMENTALS

Basically, there are five ways to quantify something: cost, time, quantity, quality, and human reaction. In management, we measure how something changes over time and as the result of different activities. However, we rarely measure how something is changing. Revenue, expense, customers, and employees all move constantly. The fundamental questions are how much has each factor moved, in which direction did it move, and was that direction desirable or undesirable?

In the 1970s, at the beginning of human resources measurement, we monitored transactions. What did it cost to hire, train, pay, and retain employees? How many did we hire, train, or retain? In time, the question emerged: what matters? It became clear that even for a background function such as HR, change should be viewed in terms of its effect on the organization's goals. Gradually, we moved toward performance monitoring. If we changed our hiring strategy, could we see improvement in employee performance and attrition? If we offered training, did we see productivity increase and rework decrease? After showing this information to management, managers' question was, "How do we compare?" So we began benchmarking, which gained some popularity in the mid-1980s.

At Saratoga Institute, in 1985 we published the first national benchmarks. They grew to eventually cover about 500 companies in more than a dozen industries and 1,000 more in Asia Pacific, South America, and Europe. Soon we began to see trends within industries or regions. This was the first simple descriptive analysis. The new question emerged, "Why was there a trend?" Through observation, we speculated about the reasons, yet we had little proof. It wasn't until the application of predictive analysis that we could make definitive statements and back them up with objective data.

I left Saratoga Institute in 2002 in search of new ways of describing human capital's effects. From 2006 through 2008, I published *The Workforce Intelligence Report*, which was a best practices document drawing on research across 700 companies. As I labored to collect the

data, I asked myself the question made popular by that 1969 Peggy Lee Grammy-winning song, "Is That All There Is?" I wondered whether we had we hit the end of the road in people analysis. Should we do what Peggy suggested—"break out the booze and have a ball—if that's all there is"?

INTANGIBLES

In 2001, Baruch Lev, professor of accounting at New York University, published his work on accounting for intangibles.[3] He defined intangibles assets as "*a claim to future benefits that does not have a physical or financial embodiment.*"[4] (Italics added.)

Lev made a strong case for recognizing the value of intangibles on the balance sheet. He pointed out that for every $6 of market value of the Standard and Poor's 500 companies, only $1 appears on their balance sheets.

He admitted that these assets are high risk, lack control over their benefits, and lack markets.

Nevertheless, he argued that globalization and information technology have changed the structure of corporations and pushed intangibles into the role of the major value drivers of businesses in developed economies. Two of the three intangible value classes are organizational practices and human resources.

Shortly after the publication of *Intangibles*, I had the opportunity to visit Baruch Lev in his office at NYU. He told me that when he talked to financial executives, the interest level was quite high. Yet the action level remained quite low. Apparently, the prevailing belief is if something cannot be sold during a bankruptcy action (i.e., Kodak selling its patents), then it is not an asset. Clearly, it is time for accounting to open up to seeing the world as it really is, not as it was during the industrial era.

PREDICTABILITY

As recently as 2006, predictive analytics had not yet appeared in human resources. Yet it seemed to me that we needed a way to look into the future of human capital investments. We knew a lot about

human resources practices and human capital outcomes and values, but we still could not forecast or predict the results of investments in people with any certainty. Predictive statistics were available and were being used in other functions, but I knew from decades of experience with HR practitioners that if we just pushed them into the statistical pool, they would drown. No one ever joined HR because he or she loved numbers. In fact, in many cases it was just the opposite. People wanted a job without numbers, just lots of hugging.

NEED FOR DEFINITION

No one whom I knew had a definitive idea of how to apply predictive analytics to human resources in a systematic way. Even SAS Institute, a leading analytics firm that I had consulted for in the late 1990s, had not made a strong commitment to analyzing HR. So we were left with the apocryphal question of Wilbur Wright, "It's a great theory, Orville, but will it fly?"

Just like the Wright brothers, we needed a vehicle to support our attempts to fly. I decided to enlist the support of some of the best brains in and around the human capital arena. Eventually, I obtained the backing of a dozen major firms and several thought leaders to build a predictive model. Particularly helpful were the thoughts of author Doug Hubbard and Professor Nick Bontis.

For 18 months, we labored to develop an interrogative model.[5] We needed a way to penetrate the obvious. The more we looked at it, the more I could see that analytics was split into two paths. Unlike what we thought in the beginning, statistical procedures are not the starting point. We needed to find out what we didn't know about any situation into which we wanted to apply statistical analysis before we threw metrics at it. In the end, we designed what is now known as HCM:21 (Human Capital Metrics the 21st Century).

BREAKTHROUGH

Partly through the acceptance of HCM:21 and the work of other thought leaders such as Gene Pease and Boyce Byerly, the dream has become a reality. HR practitioners have begun to embrace analytics,

and organizational leaders are demanding increasing accountability from HR.

Analytics is the science of analysis. Analysis comes from the Greek, *analutika*, meaning "to separate the whole into its component parts." As I mentioned earlier, there are two levels of analytics. Descriptive analytics tells what has happened in the past and usually the cause of the outcome. Predictive analytics focuses on the future, telling what is likely to happen given a stated approach. Then prescriptive analytics tells us what to do to make it happen.

Predictive analytics is used in actuarial and financial services, insurance, telecommunications, retail, travel, health care, and pharmaceuticals, among others. Internally, R&D, marketing, advertising, and customer service functions have been applying analytics to their work for many years. The irony is that while HR people have stubbornly claimed one could not predict the behavior of employees in a closed environment, those other functions have been analyzing and predicting customer behavior across the much more complex open marketplace.

Analytics promises to describe, with a high degree of probability, the behavior of people inside organizations. Now we are able to apply descriptive analytics to understand current human capital problems and prescriptive analytics to improve future outcomes from human capital investments.

PRACTICALITY

Businesspeople are driven to produce. This need is aggravated by the fact that there is seldom complete data around a complex situation. As a result, many managers race to a solution without fully understanding the surrounding circumstances. In almost every client meeting, one of the first questions is, "What should we measure?" Yet in practice, measurement is the last step in analysis and planning.

Many analytics projects that I have encountered are one-off exercises to solve a single problem. In time, the project is completed with some degree of success. However, soon another problem or opportunity arises, and the discovery process starts from step one all over again. I find this very inefficient and often ineffective. I strongly

believe, based on witnessing several poor-performing projects, that a well-defined, consistent, programmatic approach is necessary. In short, without an analytic model, managers are condemned to trial and error as they struggle to relearn an investigative process every time.

ANALYTICS MODEL FOUNDATION

Human capital management and analytics rest on two pillars. One is a logical framework of questions. The initial step is the development of the logic process. One of the books that had made the greatest impression on me in college was *Plato's Republic*, specifically the section where Socrates and Thrasymachus discuss "What Is Justice?" The questioning method impressed me as a great pathway into the application of predictive analysis. It asks penetrating questions to test beliefs and impressions, such as:

- What is happening?
- Why is it happening?
- What effect is it having on our organization?

Next, what is happening within our organization that is affecting our ability to perform or to reach new goals?

Then, given our knowledge of the marketplace and our organization,

- What options do we have to improve our position?

Those and several other probing questions test the logic of our position. In the end, they add confidence that we are starting along the right path.

The second supporting column is a combination of statistical analysis and computer technology that helps us analyze the qualitative and quantitative data we have in order to produce the most efficient, effective, and sustainable outcome.

Thus, the starting point is to understand the marketplace, as mentioned earlier, and then to assess our organization's strengths and weaknesses as they relate to market forces and to our systems, culture,