Guidebook

Evidence-Based Selection

Using data to make better hiring decisions

What is it? How does it work? Why should we do it? What are the outcomes? How do we get started?

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Introduction

Preface

In February 2010 Trinity Health launched an initiative named Best People /Spiritual Workplace. Phil McCorkel, president and CEO, Saint Mary's in Grand Rapids asked Tom Karel to take that opportunity and do something transformational for Trinity Health. Tom convened a regional team to work together to redesign and transform Trinity's Human Resources practices.

Central to all of that work has been a clear line of sight to the patient. At every step there was recognition that health care is the business of people caring for people. The new and emerging science and technology make headlines and those advancements are certainly important to patients. But equally important are the words and behaviors of every single person that interacts with our patients and their families. Health care at the very core is people caring for people. With that understanding, we know that to be the best in health care, we need to hire the best people.

A set of transformational projects were conceived and planned that would enable the West Michigan HR team to transform their talent processes. One of the key processes is the evidence-based selection process (EBSP).

Over the years, we have focused a lot on the process—the steps we follow to evaluate applicants. More recently, however, we have concluded that it is more about the data that we use to make the selection decisions, than it is about the order of events. We need to gather the most relevant data that will inform the hiring process so our talent acquisition professionals and hiring managers have the information they need to make high quality hiring decisions.

In the end, it is really about the outcomes. We have five key metrics that indicate the outcomes of the evidence-based selection process. They are: (1) first-year turnover, (2) time-to-fill, (3) recommend/hire ratio, (4) quality of selection, and (5) diversity. We have benchmark data and baseline data. Each month we track and report a comprehensive set of metrics that align with these goals. First-year turnover is a key metric to track our fiscal performance. Turnover has clearly understood financial implications, so each month we calculate the savings due to decreased first-year turnover. First-year turnover has also come to be accepted as a proxy for quality of hire. When we hire the right people and put them in the right job, they perform well and they stay with the organization. Time-to-fill relates to vacancy rates and is an important indicator of the staffing stress that hiring managers feel. Our metrics give us confidence that the evidence-based selection process is contributing to improved organizational performance on a number of important dimensions.

The evidence-based selection process is now a proven process with solid performance gains that provide a substantial return on investment. Now that the process is proven, we have turned our attention to streamlining and automating the process for greater labor efficiency, and to implementing assessments with greater ease of use and lower costs.

This paper on evidence-based selection was designed with distinct sections and lots of graphics. We hope you can flip through the pages and quickly find the information most important to you and easily skip over the things you don't need.

The Human Talent Genome

Sequencing the human DNA has provided a platform for many innovations in medical diagnostics and treatments. We see a parallel need to decode the DNA of human performance. We need to understand at the deepest levels the structure of competencies that enable performance and the relative importance of various competencies to health care jobs.



"Competency" is an interesting word that means many things to many people. Conversations seeking to clarify competencies are challenging. We have competency-based education, competencies on job descriptions, and competency assurances for Joint Commission compliance. A lot of people are talking about competencies, and they are using that word in different ways.

Competencies tend to be organized into frameworks and models. We generally use a threelevel model with (1) professional competencies on top, (2) industry-wide competencies in the middle, and (3) foundational competencies at the base. Professional competencies are frameworks like those created by professional organizations and boards that are used for professional credentialing and licensing. Industry-wide competencies include things like CPR, and infection control. Foundational competencies include things like reading, writing, listening, speaking, perception, customer service, teamwork, problem solving, interpersonal orientation, adjustment, conscientiousness, vision, strength, dexterity, stamina, and coordination.

Through job analysis, we first clarify the tasks that define the things we do in various health care jobs. Then we link the tasks to the foundational competencies and work with subject matter experts to confirm the importance levels of each competency to each job family.

EBSP and Evidence-Based Medicine

Evidence-based selection is the human resources parallel to evidence-based medicine.



Sticking with our medical metaphor, the way that evidence-based medicine aligns clinical information with research evidence and patient values is a model for how evidence-based selection aligns applicant information with job analysis evidence and applicant goals.

We start with job analysis to understand the most important competencies for each job family. Next, we gather evidence of cognitive competencies, character competencies, structured reference information, and structured interview questions on topics such as: perception, service orientation, active listening, office administration, time management, influencing, teamwork, and critical thinking. All applicant data is collected following carefully designed processes to assure accurate objective data collection. Then it is organized into databases so that key dimensions of the applicant evidence can be correlated to performance to confirm the reliability and validity of the evidence-based selection process.

Evidence-based selection was initially developed based on best practices and professional standards in the field of Industrial/Organizational psychology. Initial process design and selection standards were set based upon extensive local job analysis and concurrent validation testing. Further refinements will be made based upon longitudinal validation data that will correlate applicant information with job performance data collected on new hires.

What is Evidence-Based Selection?

What is Evidence-Based Selection?

Evidence-based selection is a process that leverages the use of highly relevant quantitative information about applicants to improve selection decisions. We are applying data-based decision processes to talent acquisition decisions.

The Applicant Funnel

The applicant funnel illustrates the sequence of steps used to engage and evaluate candidates. The steps are organized in a sequence that optimizes labor efficiency and minimizes testing costs.



The **Auto Prescreen** step is the only portion of the process that is still being developed. Currently knock-out questions and ranking questions are used in Position Manager to prescreen candidates. Soon we will add an overall performance index that will enable us to rank order candidates based on character (personality, behavioral) factors.

The **Manual Prescreen** stage is typically a discussion with the applicant to review their key application data and job goals to determine if a fit is possible. If this discussion is extremely

positive, the TA specialist may also conduct their portion of the structured interview at the same time.

The **Test & Check** step includes WorkKeys cognitive tests, Hogan personality tests, SkillSurvey reference checks, and selected credential and licensing verification. The specific tools may vary over time as new vendors provide offerings that are better, easier to use, and/or more cost effective. What will remain constant is that we will perform job-related cognitive tests, personality tests, reference checks, and credential and licensing checks.

The **Interview** step utilizes structured interview guides (SIGs) to ensure that we gather information related to job performance. The SIGs include behaviorally anchored rating scales (BARS) so that candidates can be objectively scored on a 1 to 5 scale on each of the questions regardless of the particular interviewer. SIG question scores will be evaluated for effectiveness, reliability, and validity as part of the longitudinal validation work along with the assessments to ensure they are job-related and effective for each job family. Two SIGs were developed that each have four questions. The first SIG is used by the recruiter during this interview step. The other SIG is used by the hiring manager during the next step.

The **DASH** step represents the Day of Action Selection and Hiring. DASH is the step that engages the hiring managers in the process. Some job families have a constant stream of new hires. DASH was invented to provide hiring managers with a convenient schedule of regular meetings that would enable them to evaluate all candidates recommended by the recruiter on a single afternoon each month. The DASH methodology is most helpful in job families that have numerous hires each month. Candidates are immediately informed at DASH that they are being moved into one of three categories: (1) approved for hire, (2) approved and recommend to the hiring pool awaiting an approved requisition that is a good fit for the candidate, or (3) rejected.

The **Hire** step contains the elements of the talent acquisition process that are required to be performed post-offer such as the employment physical and drug screening.

The EBSP Toolkit

The evidence-based toolkit illustrates the tools utilized at various steps of the process.

Evidence-Based Selection Toolkit

- WorkKeys[®] Locating Information & Workplace Observation
- Hogan[®] HPI, HDS, and MVPI
- Prophecy[®] Nursing Tests
- SkillSurvey[®] Reference Check System
- Certiphi[®] Education, Licensure, Certification Check System
- Interview Structured Interview Guides with BARS
- Employment Physical & Drug Screen
- ETS FACETS® Planned for prescreening tool
- Benchmark Partners Exit surveys and interviews
- Position Manager[®] Applicant Tracking System (ATS)
- PeopleSoft[®] Human Resources Information System (HRIS)

Talent Acquisition Specialists make selection recommendations

We are currently using Prophecy testing for nursing job families. All other families use WorkKeys for cognitive assessments and Hogan for personality assessments. ETS cognitive and personality assessments are being evaluated and validated for ease of use, cost effectiveness, and predictive validity.

A key initiative going forward is to automate the process by integrating the assessment and applicant tracking systems. The need for automation and integration is driving some of our vendor selection requirements.

How does it work?

How does it work?

Evidence-based selection is based on principles of Industrial/Organization psychology summarized by Hunter and Schmidt in their paper *The Validity and Utility of Selection Methods in Personnel Psychology: Practical and Theoretical Implications of 85 Years of Research Findings,* published in 1998. Their research identified the most effective selection methods and provided a ranking of the most common selection methods.

EBSP is built on the foundation set by Hunter and Schmidt. Hunter and Schmidt identified the most important selection tools and rank-ordered the tools that provide the highest incremental validity for the macro jobs market. We accepted that for the macro jobs market that the relative effectiveness of various selection methods is as stated. We set out to do the same for each health care job family. That led us to ask, what would be the most effective selection tools for health care jobs? And what are the most effective tools for each job-family?

The EBSP process, validation studies, and analytics are designed to answer those questions. The first step is to organize around a few key dimensions. Three key talent challenges emerge:

- Structure of Jobs and Job Families Many organizations have hundreds or thousands of job codes and job descriptions. As mergers occur, job codes and job descriptions proliferate. Large organizations may have hundreds of titles and job descriptions for the same job. Licensing and credentialing requirements add another level of complexity.
- **Competency Models** Competency models are generally only competency lists developed and used by one area of the organization. Rarely do organizations have comprehensive competency models that are common to all areas of the organization with common job families, job codes, and job descriptions used for talent selection, talent development, professional standards, compensation, etc. Health care organizations often work in disconnected silos.
- **Tasks and Task Families** Job descriptions are frequently written locally to describe an individual job or small set of jobs. The large diversity of job descriptions makes it difficult to generalize work.

We decided to build upon the SOC Code framework and leverage O*NET codes and occupational data to organize our job analysis and validity studies. We organized the work of healthcare along three dimensions:

- Jobs and Job Families
- Competencies and Competency Families
- Tasks and Task Families

Details of these frameworks are provided in the pages that follow.

Predictive Validity

Predictive validity defines the degree to which a selection tool is an effective predictor of job performance. Validities are determined by conducting validity studies.

Predictive Validity for Ove with a Second Predictor.	erall Job Perf	formance of G	General Mental Ability (GMA)	Scores Combi	ined
Personnel Measure	Validity (r)	Multiple R	Additional validity from adding a second predictor	% Increase in validity	_
GMA tests	.51				
Interview (structured)	.51	.63	.12	24%	
Job knowledge tests	.48	.58	.07	14%	(
Integrity tests	.41	.65	.14	27%	
Interview (unstructured)	.38	.55	.04	8%	
Assessment centres	.37	.53	.02	4%	
Biographical data	.35	.52	.01	2%	
Conscientiousness tests	.31	.60	.09	18%	(
Reference checks	.26	.57	.06	12%	
Job experience (years)	.18	.54	.03	6%	
Years of education	.10	.52	.01	2%	
Interests	.10	.52	.01	2%	
Graphology	.02	.51	0	0%	ſ
Age	01	.51	0	0%	

Some selection methods predict performance better than others. Selection systems are most helpful and legally defensible when each element in the system is job-related, aligned with a business necessity, and demonstrated to be a valid predictor of performance by a validity study.

Overall, for jobs in the American workforce, Hunter and Schmidt determined that the following items are the top six predictors of performance: (1) cognitive skills (General Mental Ability), (2) integrity tests, (3) structured interviews, (4) conscientiousness tests, (5) job knowledge tests, and (6) reference checks. Based on these findings, we set out to determine the most effective tools for each of the jobs in health care. The first step was to organize jobs into job families.

Job Families

Job families are groupings of similar jobs.

				Job F	am	ili	es				
			н	ealth Care Job Families with O*NET/BL	S Data (Basis fo	or Trinity	/ Health Job	Analysis)		
1	'H Fa	mily	ONET Code	ONET Occupations	Level	Educatio	n Factor	Openings 2010-2020	Employment 2010	Median V Hourly	/ages 2011 Annual
			Environment	al Services Job Family			1.69		3,962,000		\$20,563
			37-2011.00	Janitors and Cleaners, except Maids & Hskpg	HS	63%	1.76	682,000	2,310,000	\$10.75	\$22,370
	1	ES	37-2012.00	Maids and Housekeeping Cleaners	HS	64%	1.68	351,900	1,427,000	\$9.32	\$19,390
			51-6011.00	Laundry and Dry-Cleaning Workers	HS	64%	1.64	44,300	225,000	\$9.58	\$19,930
	_		Nutrition Ser	vices Job Family			1.61		1,898,000		\$21,364
_			35-2021.00	Food Preparation Workers	LT	54%	1.48	377,100	814,000	\$9.27	\$19,270
s	2	NIC	35-3022.00	Counter Attendant, Concession, Coffee Shop	LT	75%	1.26	350,400	446,000	\$8.92	\$18,560
т	2	NS	35-3041.00	Food Servers, Nonrestaurant	LT	38%	1.46	96,700	209,000	\$9.40	\$19,550
A			29-2051.00	Dietetic Technicians	LT	35%	2.15	8,100	24,000	\$12.85	\$26,730
F			35-2012.00	Cooks, Institution and Cafeteria	LT	47%	1.67	136,200	405,000	\$10.92	\$22,710
F *	3	MA	<u>31-9092.00</u>	Medical Assistants	HS	41%	2.81	243,800	528,000	\$13.99	\$29,100
F			Patient Care	Assistants Job Family			2.56		3,507,000		\$23,681
Y			31-1011.00	Home Health Aides		not availab	le	837,500	1,018,000	\$9.91	\$20,610
2			31-1013.00	Psychiatric Aides	HS	63%	2.60	19,000	68,000	\$12.10	\$25,170
0	1	DCA	31-1014.00	Nursing Assistants		not availab	le	496,100	1,505,000	\$11.63	\$24,190
1	4	FUA	31-1015.00	Orderlies		not availab	le	included	above	\$11.63	\$24,190
2			31-2012.00	Occupational Therapy Aides	SC	42%	3.04	3,600	8,000	\$13.56	\$28,200
			31-2022.00	Physical Therapist Aides	HS	64%	2.43	27,600	47,000	\$11.39	\$23,680
			39-9021.00	Personal Care Aides	HS	59%	2.18	675,200	861,000	\$9.49	\$19,730
			Registered N	urse Job Family			4.39	1,207,400	2,737,000	\$31.71	\$65,950
	5	RN	<u>29-1141.00</u>	Registered Nurses	A	64%	4.26	included	above	\$31.71	\$65,950
	5		29-1141.01	Acute Care Nurses	A	75%	4.35	included	l above	\$31.71	\$65,950
			29-1141.03	Critical Care Nurses	A	50%	4.55	included	above	\$31.71	\$65,950
		(D*NET	Data: Code, Occup	ation	n, E	duca	ation, a	and Wa	ages	

We initially set out to identify 20 groups of jobs that would cover 80% of the workforce in West Michigan. The first job groups were easy to identify. Then, as it became more difficult we turned to the SOC code framework and the O*NET for help. We searched the O*NET for jobs in the healthcare sector and grouped them into logical groups. Then we reviewed occupational titles, occupational definitions, educational attainment data and wage data for each

Next we constructed a series of KSA Charts to study the importance levels of relevant knowledge, skills, abilities and work styles within and across job families. After carefully considering all of this data we decided on 21 job families that cover over 90% of the jobs.

occupational code within a job family to test if we were grouping similar jobs.

Ultimately the job families are confirmed by our SMEs as part of the job analysis process.

A complete list of the 21 job families is provided in Appendix A.

Foundational Competencies – Knowledge, Skills, Abilities, and Work Styles

This graphic illustrates the O*NET content model and foundational competencies definitions.



There are numerous competency models and frameworks. We introduced the three-level competency model in *The Human Talent Genome* section (page 4). This graphic is included to clearly illustrate the foundational competency definitions used in this work.



The O*NET is the nation's largest database of jobs and jobs information. The O*NET is a project of the U.S. Department of Labor. As a result, O*NET is an open-source database that is publicly available for our use and equally important the use of our education and community partners.

We organized data on the importance levels of job knowledge, skills, abilities, and work styles for each occupational code included in our list of job families. We analyzed the variations in importance levels within and across job families to ensure we grouped similar jobs. We used this data as a starting point in our job analysis process.

Competency Families

	Har	monized - Know	ledge, Skills, and Abilities (KSAs) - Competency Families - STAFF
ltem No:	Impor- tance	KSA	KSA Description
1.0	71	Listening	Listening to others to receive verbal information.
1.1	70	Active Listening	Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
1.2	71	Oral Comprehension	The ability to listen to and understand information and ideas presented through spoken words and sentences.
1.3	64	Speech Recognition	The ability to identify and understand the speech of another person.
1.4	33	Auditory Attention	The ability to focus on a single source of sound in the presence of other distracting sounds.
1.5	32	Hearing Sensitivity	The ability to detect or tell the differences between sounds that vary in pitch and loudness.
2.0	66	Speaking	Speaking to others to convey verbal information.
2.1	70	Oral Expression	The ability to communicate information and ideas in speaking so others will understand.
2.2	65	Speech Clarity	The ability to speak clearly so others can understand you.
3.0	63	Reading Charts	Reading documents, charts, graphs, tables, and forms.
4.0	63	Reading Text	Reading prose, continuous text.
4.1	62	Reading Comprehension	Understanding written sentences and paragraphs in work related documents.
4.2	63	Written Comprehension	The ability to read and understand information and ideas presented in writing.

Competency families group related competencies for job analysis.

The O*NET model contains 136 competency elements of knowledge, skills, abilities, and work styles. In our work with subject matter experts (SMEs) during the job analysis process we learned that the list of 136 KSAs was too long to be useful. As a result we grouped similar competencies into competency families so that SMEs could have coherent and productive conversations regarding the relative importance of various foundational competencies.

Grouping of competencies into competency families was an important innovation to gather accurate feedback from SMEs. After a few iterations we settled on a set of 32 competency families grouped into three sections: cognitive competencies, character competencies, and physical competencies.

A complete list of the 32 competency families is provided in Appendix B.

Task Families

4.A.1	Information Input	Where and how are the information and data gained that	are n	eeded to perform this job?
4.A.1.a	Looking for and Receiving Job-Related Information	How is information obtained to perform this job?	1	Obtaining, Looking, Receiving, Getting, Monitoring
4.A.1.b	Identify and Evaluating Job- Relevant Information	How is information interpreted to perform this job?	2	Interpreting, Identifying, Evaluating, Inspecting, Estimating
4.A.2	Mental Processes	What processing, planning, problem-solving, decision-ma relevant information?	king,	and innovating activities are performed with job-
4.A.2.a	Information and Data Processing	How is information processed to perform this job?	3	Processing, Judging, Evaluating, Analyzing
4.A.2.b	Reasoning and Decision Making	What decisions are made and problems solved in performing this job?	4	Deciding, Solving, Reasoning, Decision Making, Thinking, Updating, Using, Developing, Scheduling, Organizing, Planning, Prioritizing
4.A.3	Work Output	What physical activities are performed, what equipment a complex/technical activities are accomplished as job outp	and ve outs?	ehicles are operated/controlled, and what
4.A.3.a	Performing Physical and Manual Work Activities	What activities using the body and hands are done to perform this job?	5	Performing, Handling, Moving, Controlling, Operating
4.A.3.b	Performing Complex and Technical Activities	What skilled activities using coordinated movements are done to perform this job?	6	Performing, Interacting, Drafting, Laying Out, Specifying, Repairing, Maintaining, Documenting, Recording
4.A.4	Interacting With Others	What interactions with other persons or supervisory activ	vities o	occur while performing this job?
4.A.4.a	Communicating and Interacting	What interactions with other people occur while performing this job?	7	Communicating, Interacting, Interpreting, Establishing, Maintaining, Assisting, Caring, Selling, Influencing, Resolving, Negotiating, Performing, Working
4.A.4.b	Coordinating, Developing, Managing, and Advising	What coordinating, managerial, or advisory activities are done while performing this job?	8	Coordinating, Developing, Managing, Advising, Building, Training, Teaching, Guiding, Directing, Motivating, Coaching, Consulting
4.A.4.c	Administering	What administrative, staffing, monitoring, or controlling activities are done while performing this job?	9	Administering, Performing, Staffing, Monitoring, Controlling

Task families group similar job components.

Task lists are job specific. As we worked to combine task lists for related occupational codes into one task list for each job family we found it helpful to group tasks into task families. The task families were constructed on the O*NET Generalized Work Activities (GWAs) taxonomy.

Our ultimate goal is to develop a harmonized list of competencies that synthesizes tasks from the O*NET with competency frameworks from professional credentials, licensing standards, job descriptions, and competencies identified for Joint Commission compliance. This harmonized set of competencies could then be used as feedback to all stakeholders to improve and align competency models across the health care industry.

GWAs help us to understand the jobs at a job component level so that we can observe elements that are common within job families and common across job families. Ultimately we can use this information to extend validity to jobs that are beyond our core job families enabling us to use the assessments for all selection decisions.

A complete list of the 9 task families based on the 41 GWAs is provided in Appendix C.

O*NET-Based Job Analysis

The O*NET-based job analysis process is a method to leverage the O*NET data and remain fully compliant with EEOC's *Uniform Guidelines on Employee Selection Procedures* (Uniform Guidelines) and USDOL's Office of Federal Contract Compliance Programs (OFCCP).

O*NET-Based Job Analysis

- Job Families Organize families of similar jobs
- Competency Families Organize KSA chart to group KSAs
- Tasks Combine tasks for job family around action verbs
- Task Families Group tasks into 9 GWA-based job components
- Job Shadow Confirm and/or edit task list and tools & technology
- Linking Record examples of the use of each competency
- SME Sessions Review, confirm and/or edit all of the above with a diverse group of subject matter experts (SMEs). Then, have SMEs individually rate the importance of each competency followed by discussion to arrive at SME consensus regarding competencies.

After completing job analysis on the first seven job families, we paused to analyze the alignment between our local job analysis results and the O*NET data. We found extremely high levels of alignment. Based on that analysis, we developed the O*NET-based job analysis process. This process leverages the O*NET because it is the largest database of jobs and jobs data. We embrace the O*NET data to frame our hypothesis to define job-related competencies and their relative importance levels. Then, we work with local subject matter experts (SMEs) to confirm the O*NET data and document the results to establish point-by-point compliance with the *Uniform Guidelines*.

Ten job families have been analyzed using the O*NET-based job analysis process. SME consensus ratings have extremely high levels of alignment with the O*NET data. With these results, we can be confident using O*NET data as a means to transport validity to other job families that are too small for traditional validity studies. And, we can be confident leveraging the O*NET as a means to collaborate with educational institutions and other community partners on foundational skills for health care.

Subject Matter Experts (SMEs) Four-Steps to Consensus

SMEs follow a four-step process to review and edit tasks, linking, and competency ratings.



The *Uniform Guidelines* require local validity studies to support use of selection procedures. A key element in compliance is working with subject matter experts to define the work behaviors (tasks) in the job family, linking those tasks to the competencies that will be used for selection, and rating the importance of the competencies to determine job relatedness.

We established a partnership with the School of Public, Nonprofit, and Health Administration (SPNHA) at Grand Valley State University (GVSU). We work with graduate interns in the Masters program at GVSU to assist with job analysis. The interns prepare task lists, linking examples, and importance ratings in draft form for the SMEs. They begin with O*NET research. Next they add relevant information from research of professional competencies, licensing requirements, job descriptions, and competencies identified as important for Joint Commission compliance. Information gained from this research is synthesized into a harmonized task list for each job family. Then the interns job shadow local SMEs to refine their task lists and add details with regard to tools and technology used to complete the tasks.

After the preparation is complete, a job analysis session is held with the SMEs so they can review and edit the task list and linking examples, and provide importance ratings for each competency. All sessions have ended with consensus of our SMEs, providing us with high confidence in the results of our job analysis sessions.

Personality, Behavioral Skills

Character competencies are also known as "soft skills" and many other names.



We investigated various models of character competencies (personality factors, character strengths, work styles). We found wide agreement with regard to the importance of agreeableness, conscientiousness, and emotional stability to job performance.



Job Component Validation (JCV) Framework

Job component validation enables us to extend validity to job families that are too small for traditional validation studies.

	O*NET Importance Ratings			Criter	ion-Rela	ted Vali	dation B	aseline f	or JCV			J	ob Comp	onent V	alidatio	n (JCV) E	xtension	ns
u	Locating Information	36	48	65	54	71	55	60	65	62	69	70	63	65	61	70	78	71
wo	Workplace Observation	42	52	63	55	69	57	61	65	60	65	69	61	59	58	63	70	64
		Cut-	Scores a	nd pass	rate of o	urrent e	employe	es based	i on Vali	dation t	ests.	Cu	t-scores	based o	n analys	is of job	comple	xity
Cu	t Scores (Gravitational Hypothesis)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
		ES	NS	MA	PCA	RN	PLB	PT	REG	BOC	LPN	cw	TECH	LAB	мвс	THR	РНМ	DTN
LI	Locating Information	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	(% at or above cut-score)	80%	85%	93%	83%	98%	85%	90 %	86%	88%	86 %	TBD	TBD	TBD	TBD	TBD	TBD	TBD
wo	Workplace Observation	1	1	2	1	2	1	2	1	1	2	1	1	1	1	1	1	1
	(% at or above cut-score)	61%	76 %	82%	89%	89%	90%	77%	85%	83%	83%	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Combined pass rate for LI & WO	49%	65%	76 %	74%	87 %	77%	69%	73%	73%	71%		1	0 J	ob	fan	nilie	es
			0					- in the	-				1	<u> </u>	/or	550	4	F
C	itarian Palatad Validation Tasting		Quantit	les of te		supervi:	sor ratin	gs in the	above a	anaiysis.		Totals		CO	ver	557	0 0	
G	Renon-Related Valuation Testing	1	2	3	4	5	6	/	8	9	10	Totals		en	nplo	bye	es.	
		_ ES	INS	MA	PCA	KIN	PLB	۳I	REG	BOC	LPIN							
u	Locating Information	91	93	93	92	143	72	90	108	66	65	913	1	7 J	ob	fan	nilie	es
wo	Workplace Observation	105	102	94	97	142	72	89	110	66	65	942		CC	ovei	r 75	%.	

Job component validation is an established professional practice and is an alternative validation strategy that enables leveraging validity evidence from large job families to extend validity to job families that are too small for traditional validation studies.

We completed traditional criterion-related validity studies on 10 job families that represent 55% of the jobs in West Michigan. We then studied the job components by leveraging the Task Families structure to extend validity to an additional 7 job families that represent another 20% of the jobs in West Michigan.

Job component validation (JCV) leverages O*NET data and job analysis results to provide an initial validation study for EBSP. We are collecting longitudinal validation data as we use EBSP. Selection data, including cognitive assessments, character assessments, and structured interview questions will be correlated with performance review data to confirm the validity of each element in the selection process. This analysis will enable us to determine the data elements that are most predictive of job performance.

Why do it?

Why?

Diverse, highly competent, compassionate talent is essential to excellence in health care. Patients expect to see diversity among health care workers that reflects the diversity of the patients and the community at large. Highly competent health care workers will deliver better clinical outcomes and higher levels of patient satisfaction. Empathy, caring, and compassion are essential skills for effective relationships with patients.

Health Care is 51% Labor

The health care industry spends more on labor than all other costs combined.

Rank	Country/Region	GDP (Millions of \$US)	Healthcare is Important
¢	World 🔶	71,830,000 \$	
	European	16,417,100	If the U.S. Healthcare
1	United States	15,680,000	independent country, it
2	China	8,227,000	would be the 5 th largest
3	Japan	5,964,000	economy in the world.
4	Germany	3,401,000	2,007,000 (million a)
5	France	2,609,000	2,807,000 (millions)
6	Example 1 United Kingdom	2,441,000	U.S. GDP = \$15.68 Trillion
7	📀 Brazil	2,396,000	Healthcare/GDP = 17.9%
8	Russia	2,053,000	15.680 x 17.9% = 2.807
9	Italy	2,014,000	
10	India	1,825,000	2.807/71.83 = 3.91% Global
	CIA World Factb	ook, 2012 estimates	•

Health care is a large and growing portion of the U.S. economy. Healthcare was 17.9% of the \$15.68 trillion U.S. economy in 2012—a \$2.8 trillion industry. That is a national payroll of over \$1.4 trillion. If the U.S Healthcare industry was an independent country, it would be the 5th largest economy in the world.

Talent Impacts the Triple Aim

Health care is an industry in transformation. The triple aim sums it up best.



• Reducing the per capita cost of health care.

All health care organizations are acutely focused on the transformation that is underway. New payment models are driving rapid adoption of new care delivery models. More than ever, the industry needs a highly competent and agile workforce. The Affordable Care Act (ACA) rewards reduced readmissions and high patient satisfaction and penalizes poor performance.



- Mistakes Costly Readmissions not reimbursed
- **Patient Experience** Patients must consistently rate the patient experience high or a 1% revenue penalty is imposed.
- **Top Performing Talent as a Business Necessity** The above two funding provisions of the ACA establish a Federal Government driven business necessity for high quality talent.

Sourcing and the Talent SCM

Health care organizations need to build talent supply chains to create an abundant supply of diverse, highly competent, compassionate talent.



The health care industry is highly dependent on educational institutions and professional associations for talent. Schools are preparing the emerging talent and they are further developing existing talent with advanced skills and degrees. Professional organizations identify competencies needed by the industry, develop new credentials, and provide continuing education to the health care workforce.

Better selection systems alone will not solve the talent shortage.

Health care organizations need to create talent supply chains to build an abundant supply of talent. That means that employers need to identify the competencies related to job performance and share that data with talent supply chain partners so they can align education and development programs to the needs of the industry.

We have been actively working with Health Professions Network (HPN), Health Professions Pathways (H2P) Consortium, American National Standards Institute (ANSI), Hope Street Group (HSG), and others to build national competency frameworks to improve the quality of health care education and development programs. Professions and educators have welcomed us with open arms. Our data has been embraced as essential to these collaborative efforts.

Career Pathways

The Alliance for Quality Career Pathways (AQCP) has defined a best practice model for developing talent via career pathways.



We are working with the Michigan Center for Career Pathways (MiCCP) and the Health Professions Pathways (H2P) Consortium, and two of our local community colleges to develop and implement a national best practice model for health care career pathways.

Locally we are sharing best practices and data to help community partners to prepare individuals for careers in health care. We are linking community partners that provide foundational skills development with educational partners that provide health care education and training with data systems. The linked data systems help qualified individuals advance through education and training pathways and enable us to study the effectiveness of various programs and interventions.

Career Navigation



Job Families are arranged in a progression to illustrate career navigation opportunities.

The 21 job families are shown here to illustrate the career progression options in health care. This chart uses the wage data and education factor data from the job family chart (Appendix A). Wage data is national median data from the O*NET and the education factor data is derived from O*NET education data. A 1 represents less than high school, 2 high school, 3 some college, 4 Associates degree, 5 Bachelors, 6 Masters, and 7 Ph.D. or professional degree.

We have competed initial pilots of web-based career coaching and will share the career coaching and career navigation with community partners via our project the MiCCP (page 22).

What are the outcomes? Evidence Based Selection Process
Key Performance Metrics • Reduce First-Year Turnover • Reduce Time-To-Fill • Reduce Recommend / Hire Ratio • Increase Quality of Selection (QOS) • Increase Diversity

The following pages provide a snapshot of key metrics. EBSP was launched with ES and NS job families in January 2012, MA and PCA in the spring, and RN in July 2012. The next five job families in 2013. TECH, LAB, MBC, THR, DTN, and PHRM were added in the spring of 2014. The chart below summarizes the scope of the program over the first 2¾ years of implementation. Job family names and abbreviations are listed in the job family chart in Appendix B.

	Scope o	of the EBSP	Program - Jan 20	Summary of Hires	s and Termi	inations	
Hired	GR	Musk	Region	Termed	GR	Musk	Region
ES	61	87	148	ES	21	35	56
NS	75	29	104	NS	28	11	39
MA	136	122	258	MA	42	22	64
PCA	219	93	312	PCA	60	30	90
RN	200	145	345	RN	24	14	38
PHT	13	20	33	PHT	3	4	7
PLB	32	20	52	PLB	10	6	16
REG	52	27	79	REG	4	3	7
LPN	23	3	26	LPN	2		2
CW				CW			
ТА		3	3	TA			
ТЕСН	13	11	24	TECH		1	1
LAB	2	1	3	LAB			
MBC	2	5	7	MBC			
THR	1	2	3	THR			
PHRM				PHRM			
DTN	3		3	DTN			
FLS	1		1	FLS			
MGR		1	1	MGR			
AP				AP			
PC				PC			
PS				PS			
OTHR	21	8	29	OTHR	1		1
ALL JOBS	854	577	1431	ALL JOBS	195	126	321

First-Year Turnover Trend



The following chart illustrates the reduction in first-year turnover for all staff jobs.

The first-year turnover baseline of 25.3% was calculated based on the first 7 job families and is shown above in yellow. The data above summarizes the 12-month rolling totals for (1) terminations within the first year of service, (2) number of individuals that worked in their first year of service during that period, and (3) the percentage turnover for first-year of service. Percent turnover of 17.15% for September is based on 154 terminations of individuals in their first-year divided by 898 individuals hired (worked first-year). Turnover is 17.15% = 154/898.

Benchmark data is indicated by red (50th percentile) and green (75th percentile) lines.

The data represented by green dots in August (15.6%) and September (13.9%) indicate the firstyear turnover percentage if adjusted to eliminate "zero hour" jobs. Zero hour jobs are contingent labor positions that are not budgeted for any minimum number of hours per week.

The talent acquisition team meets monthly to analyze all terminations. They seek to understand the reasons for each termination and to develop a deep understanding of the causes of turnover. The lessons from the analysis are used to improve the process and inform policy.

Our goal is to reduce first-year turnover to 8%.

The financial implications of reduced first-year turnover are provided on page 30.

First-Year Turnover by Job Family



The following chart illustrates the first-year turnover by job family.

The table and chart above illustrate the first-year turnover rates overall and for each job family. Zero hour jobs generally have much higher turnover rates than budgeted jobs where associates are provided a minimal number of hours per pay period. We have been working to reduce the number of zero hour jobs to improve first-year turnover.

Reduced Time-to-Fill



The following chart illustrates the average time to fill.

Average time to fill has varied from a high of 41 days to a low of 17 days over the last 12 months, most recently 31, 39, and 29 days for July, August, and September.

Benchmark data is indicated by red (50th percentile) and green (75th percentile) lines.

Time to fill has been consistently better than the 75th percentile benchmark.

Improved Recommend/Hire Ratio

The following graphic illustrates the recommend/hire ratio.



Recommend/hire ratio is a process metric. This ratio describes the ratio of the number of candidates recommended to a hiring manager to the number of candidates hired by the manager. Benchmark performance is a ratio of 10 to 1 for 25th percentile performance and 5 to 1 for 75th percentile performance. Our recommend/hire ratio has been consistently below 2 to 1 which greatly exceeds the 75th percentile performance benchmark. This saves hiring managers time by sending them only highly qualified candidates.

Improved Diversity

		7 JOBS	7Jobs
Row Labels	nonEBSP	EBSP	
African American			
AMIND	10	2	12
ASIAN	48	13	61
BLACK	186	63	249
HISPA	121	29	150
Hispanic	0	0	0
NSPEC	21	25	46
PACIF	1	0	1
WHITE	1820	484	2304
(blank)			
Grand Total	2207	616	2823
Row Labels			
African American			
AMIND	0.004531	0.00325	0.00425
ASIAN	0.021749	0.0211	0.02161
BLACK	0.084277	0.10227	0.0882
HISPA	0.054826	0.04708	0.05313
Hispanic	0	0	0
NSPEC	0.009515	0.04058	0.01629
PACIF	0.000453	0	0.00035
WHITE	0.824649	0.78571	0.81615
(blank)	0	0	0
Grand Total	1	1	1
	0	0	0
	0	0	0
Diversity	17.54%	21.43%	18.38%

The following chart illustrates the improvement in diversity.

Diversity in the table above is defined as "non-white" hires. This snapshot of data indicates that overall diversity increased from 17.54% to 21.43% for hires that were screened using the evidence-based selection process. This analysis is based on the 7 job families included in the original baseline.

Financial Value of Reduced Turnover

	EBSP Rolli	ng 12-Months	Savings Calcula	tions - First-Year	[.] Turnover	
	Terms	Hires	1st-Year-%	Improvement	Reduction	Savings-\$
October	112	708	15.8%	9.5%	67.1	\$1,796,842
November	111	717	15.5%	9.8%	70.4	\$1,884,564
December	123	730	16.8%	8.5%	61.7	\$1,651,380
January	137	759	18.1%	7.2%	55.0	\$1,473,018
February	139	796	17.5%	7.8%	62.4	\$1,670,064
March	142	813	17.5%	7.8%	63.7	\$1,704,891
April	150	839	17.9%	7.4%	62.3	\$1,666,825
May	158	787	20.1%	5.2%	41.1	\$1,100,500
June	167	902	18.5%	6.8%	61.2	\$1,638,423
July	170	946	18.0%	7.3%	69.3	\$1,856,109
August	180	966	18.6%	6.7%	64.4	\$1,723,870
September	154	898	17.1%	8.2%	73.2	\$1,959,330
Potential A	225	1500	15.0%	10.3%	154.5	\$4,135,811
Potential B	188	1500	12.5%	12.8%	191.5	\$5,126,264
Potential C	150	1500	10.0%	15.3%	229.5	\$6,143,486
Potential D	120	1500	8.0%	17.3%	259.5	\$6,946,556

Reduced first-year turnover has substantial financial value and provides solid returns.

Notes:

1. Baseline turnover rate for the first 7 job families is 25.3%

2. Average cost of turnover is \$26,769.

The above chart provides running calculations for annual savings based on the latest first-year turnover data. Turnover for September 2014 was 17.1% based on 154 first-year terminations out of 898 hires over the 12 months ending September 30, 2014. This represents a reduction in first-year turnover of 8.2% from the baseline of 25.3%. The average cost of turnover of \$26,769 is based on an extensive study performed at Saint Mary's with Towers Perrin and System Office HR leadership in 2009. It is recognized that \$26,769 is too high for ES and NS job families and too low for RN job family. However, the number is considered accurate for the overall mix of job families. The current annual savings of \$1,959,330 is calculated by applying the 8.2% reduction to the 898 hires to yield a reduction of 73.2 terminations per year.

There is a discontinuity in the data in September. Prior to September data included volumes for Cadillac and Grayling. In September, the totals are based only on Muskegon and Grand Rapids.

The scenarios labeled as Potential A, B, etc. are provided to illustrate the potential savings as all hiring moves to the new process and further improvements in first-year turnover are achieved.

Evidence-based selection has provided a substantial return on the original project investment.

How do we get started?

Four Pillars of Talent Transformation

The West Michigan team addressed workforce planning, talent acquisition, talent development, and performance excellence for staff, provider, and leadership job families. This report is focused on the evidence-based selection portion of that work.



Benchmark data, baseline data, and monthly workforce analytics to track and report progress are important to a process improvement project. Success will require the commitments of the senior leadership team and hiring managers throughout the organization. The change effort is likely to run out of energy if there are not some measures of success reported monthly. It is important to agree with key stakeholders how progress will be measured and reported.

Value Logic of EBSP and Evidence-Based Human Resources

As illustrated above, EBSP was not launched alone. Since first-year turnover was embraced as a key performance metric, we concluded that it was essential to also address the on-boarding process to ensure new hires were appropriately assimilated into the organization. The talent development team led that work and established a best in class on-boarding process that has been standardized across the region. The on-boarding process is measured for effectiveness with orientation day surveys and 45-day new hire surveys. Data is analyzed with trend graphs and Pareto charts to determine opportunities for continuous improvement. The data also confirms that the current on-boarding process is highly effective.

Following are a few thoughts on key performance metrics and value logic.

Key performance metrics that illustrate improved talent processes and talent decisions:

- 1. Reduced **first-year turnover** is evidence of better talent selection and on-boarding.
- 2. Reduced long-term turnover is evidence of improved development and engagement.
- 3. Improved **recommend/hire ratio** is evidence of better recommendation decisions by the talent acquisition team.
- 4. Reduced **time-to-fill** is evidence of better talent planning, sourcing, and selection.
- 5. Higher **employee engagement** is complex but influenced by good job fit and a sense of growth opportunities. It depends upon selection and development of employees and leaders.

A Leadership Value Framework – Three leadership perspectives:

- Human Resources HR leaders are expected to be business partners. That means devising, proposing, and executing talent improvement strategies. HR managers need to pursue and demonstrate improvements on key performance metrics and articulate financial returns.
- **Financial Leadership** Financial managers understand that over 50% of cost is talent. Turnover is one of the easiest metrics to monetize. First-year turnover is on average \$25-30,000 per turnover. Turnover can be reduced 50-75% by aligning selection and development decisions with competencies essential to job performance.
- **Clinical Managers** Clinical leaders benefit greatly from reduced turnover as well. A highly qualified, stable workforce outperforms a rapidly churning team. Healthcare is delivered by teams. As teams work together, they perform better. Turnover erodes performance.

Managers can work together to reduce turnover, improve recommend/hire ratio, reduce timeto-fill, and increase engagement. These talent improvements have a cause-effect relationship to improving the patient care experience and reducing the per capita cost of healthcare.

Financial Value of EBSP Improvements

Financial returns will be different for each firm based on many variables. The following examples are provided to illustrate potential methods to monetize the value of improving key performance metrics enabled by improved competency models.

- Reduction in <u>first-year turnover</u> from 24% to 12%. A 12% reduction in first-year turnover based on 2,000 new hires per year is a reduction from 480 terminations to 240 terminations. The financial impact of 240 fewer terminations is <u>\$6,000,000</u> per year based on a cost of turnover of \$25,000 each.
- Reduction in <u>long-term turnover</u> from 10% to 8%. A 2% reduction in long-term turnover based on 10,000 employees is a reduction from 1,000 terminations to 800 terminations. The financial impact of 200 fewer terminations is <u>\$5,000,000</u> per year based on a cost of turnover of \$25,000 each.
- 3. Reduction in <u>time-to-fill</u> relates to a reduction in <u>vacancy rate</u>. The 2010 Advisory Board report indicates that a reduction in time-to-fill from an average of 60 days down to 40 days corresponds to a reduction in vacancy rate from 8.2% to 1.5%. The 2011 LEAN Human Capital Benchmark Study reports vacancy rates of 4.5% as 25th percentile performance and rates of 2.9% as 75th percentile performance. Therefore moving from 25% to 75% is a 1.6% reduction in vacancy rate (35% improvement). We project a 35% reduction in vacancy rate. The cost of vacancy is estimated at \$8,750 (\$35,000 salary, value multiplier of 2.0, and average 30 days time-to-fill). Total cost reduction would be <u>\$1,400,000</u> based on a reduction of 160 vacancies (10,000 x 1.6%) at \$8,750 each.
- 4. Reduction in <u>recommend / hire</u> ratio from the 25th percentile to the 75th percentile yields a savings of just over 3 hours per hire. The savings is 6,000 hours of management time based on 3 hours per hire and 2,000 hires per year. That translates to <u>\$240,000</u> based on 3 FTEs of hiring manager time at an average cost of \$80,000 per manager.
- 5. Improvement in <u>quality of hire</u> yields significant productivity gains. Hunter and Schmidt determined that an improvement of one standard deviation of improvement on the quality scale yields a 40% improvement in productivity. That is \$16,000 per worker for one standard deviation improvement in quality. Our quality of hire baseline is determined by baseline data from 1st year performance appraisals. While we can anticipate a full improvement of 0.5 standard deviations, it will be difficult to realize the full savings due to numerous constraints that impact staffing and productivity. Therefore, let's assume a much smaller improvement of \$1,600 per worker based on a performance improvement of 0.10 standard deviations. That is a total of \$<u>16,000,000</u> per year when applied to the 10,000 workers.
- Higher <u>employee engagement</u> has numerous benefits. Gallup data suggests engaged vs. disengaged average: 27% less absenteeism, 31-51% less turnover, 38% fewer accidents, 12% higher customer scores, 18% higher productivity, and 12% higher profitability.

Our Change Leadership Model

Leaders capture the hearts and minds of stakeholders in order to engage them in the work.

Keys to Successful Collaboration

- Clear line-of-sight to the patient always in our minds
- Two groups: those who serve patients directly, and those who serve patients indirectly
- Senior leadership team as peers and customers of HR
- EBSP model analogous to evidence-based medicine
- Trinity Health culture work, Guiding Behaviors, prepared the way
- · Clearly communicated "pursuit of excellence"
- Using assessments as data to drive better decisions and results
- Change leadership events with HR team
- Focus on better tools to increase expertise of talent acquisition specialists, not a focus to automate jobs

The West Michigan HR team was coming together as a region for the first time for this project. Human resources had historically been managed separately at the various locations. Three allday engagement events were designed and held for the HR staff.

Every employer and every location will have different needs for change leadership events to ensure full buy-in and engagement of the TA team and hiring managers. All organizations need to design change and engage the key stakeholders to gain their commitment to the work.

Vision of Talent Excellence

Our vision of *Talent Excellence* has been a driving force for this work.

The Need for Talent Excellence

Organizations need the <u>right people</u> with the <u>right knowledge</u>, <u>skills</u>, <u>abilities</u>, <u>and behaviors</u> in the <u>right place</u> at the <u>right time</u>.

Individuals need to find jobs that will fully utilize and reward the application of their knowledge, skills, abilities, and behaviors to an organization's goals.

Individuals need clarity around requirements for positions with higher rewards to use as guidance for career and education planning.

Careers paths are random. Career planning and navigation are inadequate. We envision a day when career planning and career navigation will be improved by clarity about the competencies required for job success, and by clarity about the education and training options that enable individuals to gain the skills needed to advance their career. This vision was a driving force that led to major job analysis and national collaboration with education and training partners.

Talent Excellence was envisioned as the human resources parallel to operational excellence. Organizations have applied LEAN and Six-Sigma process improvement methods to achieve operational excellence. We envision a day when human resources will understand and be able to achieve talent excellence in much the same way.

The "Big Idea" of Talent Excellence

We can consistently hire the right people.

mprove the	e frequency of g od" based on rat	ood selection decisions from 50% to 95%.
the right pe	erson for this pos	sition."
5 = 5	strongly Agree	Clearly on the path to become a top performer
4 - 4	1 540.0	
4 = / 3 - /	Agree Ngree somewhat	Clearly capable of becoming a top performer
4 = / 3 = / 2 = [Agree Agree somewhat Disagree	OK, but not likely to becoming a top performer OK, but not likely to become a top performer We wish they were gone, but they're still here

Excellence is LEAN Six-Sigma for Human Resources.

*Note: Selection includes external hiring and internal moves to fill a position.

There is a prevailing belief in human resources circles that people are too complex and that it is not possible to reliably predict performance. We completely disagree.

We believe that application of the Hunter/Schmidt principles tailored with the results of local job analysis and validation studies will enable us to identify the competencies that are highly predictive of job performance for each job family. We also believe that the disciplined use of those competency measures to select the best candidates will result in dramatically improved hiring.

Moneyball for Health Care

Billy Beane of the Oakland A's reinvented baseball scouting and selection.

We are doing for health care what Billy Beane did for baseball.

How the 'Moneyball' Approach Could Be Applied to HR Methods

pplying the metrics-heavy recruiting technique that the Oakland Athletics' General Manager Billy Beane used in the movie "Moneyball" has piqued the interest of some analyticscentric HR professionals.

In the book *Moneyball* (W.W. Norton & Co., 2003), written by former bond salesman Michael Lewis, Beane is

forced to rethink how he scouts and hires baseball players because his smallmarket team cannot afford to outspend much wealthier teams like the New York Yankees and the Boston Red Sox on free-agent signings. Instead, Beane and his assistant apply measurement techniques from the financial world to unearth baseball players that other



'Moneyball' star Brad Pitt.

managers undervalue. Instead of paying top-dollar for homerun hitters or players who get scouts' high yet subjective good marks, Beane seeks lower-cost players with high on-base percentages and those who force opposing pitchers to throw more pitches. Turns out these metrics correlate better with games won () than do traditional individual statistics and a scout's gut feel.

"HR is ripe for a similar revolution," said Ravin Jesuthasan, a Chicago-based Towers Watson managing director. Analytical tools such as return on improved performance curves "can help organizations analyze where improving performance of talent in different roles really makes a difference to the organization and the types of HR investments that are most effective in improving that performance."

Some of the most popular selection methods, such as experience and unstructured interviews, are less valid than some less popular methods, such as intelligence testing and structured interviews, said Thomas Timmerman, SPHR, professor of business management at Tennessee Technological University in Cookeville. Timmerman wrote an academic paper on the application of Moneyball insights to HR. He cites research that shows "experience becomes a weaker (and less valuable) predictor of performance over time, but cognitive ability becomes a stronger (and more valuable) predictor of performance over time."

By Eric Krell, a freelance writer based in Austra Texas.

Human resources recruiters are much like baseball scouts and managers.

Billy Beane used data to overcome bias. The data enabled the Oakland A's to focus on game performance statistics that are predictive of game outcomes rather than traditional measures of players. The focus on data had dramatic outcomes for the A's. Within two years, every team in baseball changed their player recruiting and selection process to copy Billy Beane.

List of Appendices, Contact Information and Copyright Notice

Appendix A – Glossary Appendix B – List of Job Families Appendix C – List of Competency Families Appendix D – List of Task Families

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