

# **GRADUATE CERTIFICATE IN PUBLIC POLICY**

## **LEARNING OUTCOMES/COMPETENCIES & ASSESSMENT RUBRIC**

### **Learning Outcomes/Competencies**

The Learning Outcomes are extracted from and are completely consistent with those for the Master of Public Policy program. Certificate program requirements have been selected and designed to ensure that certificate students have the opportunity to master these Learning Outcomes:

All students completing the Graduate Certificate in Public Policy at the University of Utah will learn--

#### **Key Learning Objectives of the core course requirements:**

*To select and apply quantitative analytical tools and techniques appropriately*

- For the formulation, implementation, and evaluation of public policies and programs
- As decision-making and problem-solving support for policymakers

*Assess the impacts and possible adverse consequences of analytical tool selection*

- For the formulation, implementation, and evaluation of public policies and programs
- As decision-making and problem-solving support for policymakers
- In particular for different stakeholder groups and in terms of social equity
- The extension to public sector ethical considerations and implications

*To identify and assess the impact of models of rationality and models of mankind*

- in policy making and program design
- theories of the policy process, economics and institutional design

*To identify and evaluate theoretical frameworks and analytical models used to explain key aspects of*

- The policy-making process
- Political and economic institutions that influence policy processes

*To develop a basic understanding of the economics of the public sector, including*

- Theoretical frameworks relating to public budgeting, taxation and expenditures
- Microeconomic principles relevant to the fields of property, torts, contracts, and criminal law

### **Key Learning Objectives of the policy focus area electives:**

To gain substantive knowledge (e.g., current statistics, problems, successes, stakeholders, and societal values) in a policy topic area of current social importance

### **Assessment of Learning Outcomes/Competencies**

Methods used to assess Learning Outcomes/Competencies:

- **Scenario based discussion topic and/or journal entry assignment** where the students reflect on the learning outcomes for the certificate programs. This is an in-class assignment (in each course) but the assignment is not a graded assignment. This activity will help the student integrate their course topic with specific competencies as they relate to a practical situation that the student may encounter in a work setting. The MPP Director will design these scenario based discussion topics and journal entry assignments to ensure fit with the overall certificate learning outcomes and the activity (discussion or journal assignment) will be incorporated and implemented by individual course instructors on behalf of the certificate program. The assessments will be collected, analyzed and brought back to the instructional faculty by the MPP Program Director and staff on an annual basis.
- ***Scheduled surveys of students who have completed the Graduate Certificate.*** This survey is administered every several years to MPP graduates. Graduate Certificate recipients will be added to the survey mailing list. The survey addresses current employment and career placements (program outcomes). It also asks the respondents to self-score their achievement of Learning Outcomes and continuous improvement in terms of the relevance of the certificate Learning Outcomes for students and alumni.
  - o *Direct assessment:* Survey respondents are asked to self-assess themselves on the Learning Outcomes in two ways:
    - The degree to which the student feels they achieved Learning Outcomes; and
    - “The relevance to your current career, or any work you’ve done since graduation.”
  - o *Indirect assessment:* Among other questions, survey respondents are asked:
    - “How relevant do you feel the (required) courses are to your current career”;
    -

- Several questions assessing different aspects of post-MPP or Graduate Certificate employment, such as satisfaction with the job, overall satisfaction with the program or certificate, and career plans; and

Open-ended questions that often provide valuable insights that do not emerge in responses to the standard questions.

## Graduate Certificate in Public Policy Course of Study

Graduate Certificate in Public Policy: May be pursued matriculated or non-matriculated. 15 credits total. Students must take four required courses and choose one policy elective.					
Core Courses					
Course Number	Course Name	Credit Hours	Prerequisite	Course Order	Offerings
PUBPL 6000*	Applications of Economic Principles and Public Policy Statistics	3	No	First	Online Only Summers
PADMN 6320	Public Policy Theories and Applications	3	No	Any	Online and In-Person Fall
PUBPL 6290	Applied Quantitative Methods for Public Policy	3	PUBPL 6000	Any time after successful completion of PUBPL 6000	Online and In-Person Fall
PUBPL 6002	Stats Packages for Public Policy	3	PUBPL 6000	Any time after successful completion of PUBPL 6000	Online Only Spring
Policy Electives					
ECON 6190	Health Economics	3	PUBPL 6000	Any time after successful completion of PUBPL 6000	Online or In-Person Summer
PADMN 6323	Policy Analysis	3	PADMN 6320	Any time after successful completion of PADMN 6320	Online Only Spring
ECON 6380	Law and Economics	3	PUBPL 6000	Any time after successful completion of PUBPL 6000	Online Only Spring

\* May be waived in favor of additional elective if student provides transcripts showing successful completion of Microeconomics and Applied Statistics.

Non-matriculated students may apply up to 9 credits toward a graduate degree per Graduate School policy.



MARKET RESEARCH BRIEF

# Market Demand for Noncredit Data Analytics Certificate Programs

Analysis of Market Viability for Certificate  
Programs in the Wasatch Front Area and  
Surrounding Region

# COE Forum

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# 1) Research Methodology

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**Project Challenge** Leadership at the University of Utah approached the Forum as they considered launching an online, noncredit data analytics certificate program. Through a combination of qualitative interviews with administrators of competitor programs and quantitative data analytics, the Forum sought to assess the market viability of an online, noncredit data analytics certificate program.

EAB's market research function provides insights which guide strategic programmatic decisions at member institutions. The Forum combines qualitative and quantitative data to help administrators identify opportunities for new program development, assess job market trends, and align curriculum with employer and student demand.

EAB reports rely primarily on labor market data from the Burning Glass Labor/Insight™ tool (description below). Reports occasionally use data from the United States Census Bureau and United States Bureau of Labor Statistics data to explore occupation and job trends. Market research reports may also incorporate Integrated Postsecondary Education Data System (IPEDS) data to assess student enrollment, demographics, and completion rates across competitor programs.

**Methodology and Definitions** **Methodology:** Unless stated otherwise, this report includes data from online job postings from December 2014 to November 2015. The Forum identified the top industries, employers, Metropolitan Statistical Areas (MSAs), titles, and skills for the Wasatch Front area and the surrounding region.

**Definitions:** "Local data" and the "local area" refer to the immediate Wasatch Front area (e.g., Davis County, Salt Lake County, Summit County, Utah County, Weber County, and Tooele County). "Regional data" refers to Utah and surrounding states (e.g., Colorado, New Mexico, Arizona, Nevada, Idaho, and Wyoming).

Annual growth in job postings is measured in the change between January 2010 and December 2014 by six-month halves (i.e., 2012 H2 is July 2012 to December 2012). 2012 H2-2013 H1 represents year one and 2013 H2-2014 H1 represents year two, which gives the most recent two complete years of data.

**Burning Glass Labor/Insight™** **EAB's Partner for Real-Time Labor Market Data** This report includes data made available through EAB's partnership with Burning Glass Technologies, a Boston-based leader in human capital data analytics. Burning Glass Technologies specializes in the use of web spidering technology to mine more than 80 million online job postings and analyze real-time employer demand. Under this partnership, EAB may use Burning Glass's proprietary Labor/Insight™ tool to answer member questions about employer demand for educational requirements, job titles, and competencies over time, as well as by geography. The tool considers job postings "unspecified" for a skill, industry, employer, geography, certification, or educational requirement when the job posting did not advertise for one of these particular job characteristics. Unspecified postings represent null values and should be excluded from the total number (n value) of job postings analyzed in the query. A more complete description of the tool is available at <http://www.burning-glass.com/products/laborinsight-market-analysis/>.



For more information about the Labor/Insight™ tool, please contact Kelly Bailey, Business Development Manager, at [kbailey@burning-glass.com](mailto:kbailey@burning-glass.com) or 732-800-2484.

## Profiled Institutions

The Forum interviewed program directors at the following institutions:

### A Guide to Institutions Profiled in this Brief<sup>1</sup>

Institution	Location	Approximate Institutional Enrollment (Undergraduate/Total)	Classification
Arizona State University	Mountain West	40,000 / 50,500	Research Universities (very high research activity)
Colorado State University—Fort Collins	Mountain West	23,500 / 31,500	Research Universities (very high research activity)
Georgetown University	Mid-Atlantic	7,500 / 18,000	Research Universities (very high research activity)
University of Delaware	Mid-Atlantic	19,000 / 22,500	Research Universities (very high research activity)

1) National Center for Education Statistics.

## 2) Executive Overview

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### Key Observations

**Job postings data shows significant growth in employer demand for data analytics professionals.** Employer demand increased steadily across the past four years and grew tremendously in the past year, when the number of jobs doubled in both local and national data. Further, contacts at profiled institutions recall they originally created certificates in response to recent growth in employer demand. Increased job opportunity suggests more professionals with potential interest in data analytics programming. The **University of Utah** should consider the creation of new data analytics certificates to satisfy this growth in employer demand.

**Contacts note that many certificate students hold master's degrees and use the certificate to supplement existing professional and educational credentials.** Additionally, data analytics certificate students tend to be mid-career professionals and commonly work in the field of data analytics. Students seek the certificate either for career advancement or to improve performance in their current role. These data analytics professionals value the certificate as an efficient way to learn skills relevant to their current job without the substantial cost and time commitments required for another master's degree.

**Many students pay certificate tuition through partial or full funding from their current employers.** Contacts at the **University of Delaware** report that 40 percent of students received full or partial reimbursement from an employer to pay for the certificate program. Many certificate students work at large, national corporations (i.e., Bank of America and Deloitte) that offer robust benefits packages that include tuition reimbursement. Consider partnerships (e.g., exclusive program pricing, promotional agreements) with local and regional employers to increase awareness of the proposed certificate program and attract data analytics professionals to the program.

**Certificate programs' curricula focus primarily on data management skills, but employers also seek professionals with technical and business skills.** Contacts at profiled programs note that students use this certificate to improve their data analytics skills as quickly and efficiently as possible, so students value courses that deliver the most essential data analytics trainings for their current or future positions. Many programs suggest or require prerequisite courses to ensure that students possess the full suite of skills in demand for data analytics employment. Further, some profiled programs incorporate case studies or capstone projects to ensure that students receive additional exposure to business administration.

**Contacts at profiled programs do not employ any specific recruitment tactics.** Because most profiled certificate programs started within the last three years, administrators still experiment with student recruitment methods to reach target markets. Contacts mention online advertisements, alumni networks, and employer partnerships as recruitment strategies to consider for certificate programs.

### 3) Employer Demand

#### Demand over Time

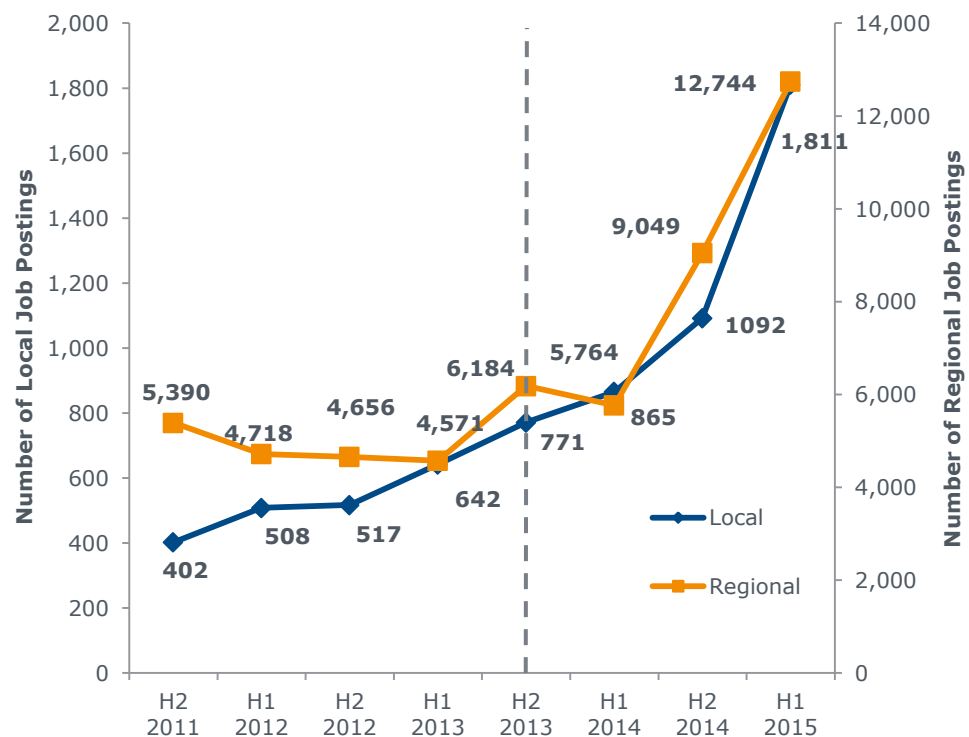
#### Local and Regional Employers' Demand for Data Analytics Professionals Increased across the Past Five Years

The growth in employer demand for data analytics professionals across the past four years justifies the exploration of new a certificate program in data analytics. In the last year of available data (e.g., from H1 2014 to H1 2015) the number of job postings increased by 109 percent locally and 121 percent regionally, which represents the fastest growth rate in recent years.

All programs contacts recall that they originally created the certificate program due to the growth in job opportunities and subsequent demand for professional trainings and certificates in the field. Further, certificate programs at **Georgetown University**, **Arizona State University**, and the **University of Delaware** all started within the past five years, which confirms this recent increase in demand for more data analytics programming.

#### Number of Job Postings for Data Analytics Professionals<sup>2</sup>

Local and Regional Data, July 2011-June 2015<sup>3</sup>



2) Data collected for H2 2013 and after is not directly comparable to data collected before H2 2013 due to improvements in Burning Glass Labor/Insight's web spidering technology.

3) Burning Glass Labor/Insight™.

## Top Industries and Employers

## Employers in Software, Consulting, Business Support, and Health Care Industries Seek Data Analytics Professionals

Top industries that posted data analytics positions in the region include insurance carriers, software publishers, consulting companies, and hospitals. Software publishers represent the industry most in the demand for data analytics professionals in the immediate Wasatch Front area, and the second most in demand across the region.

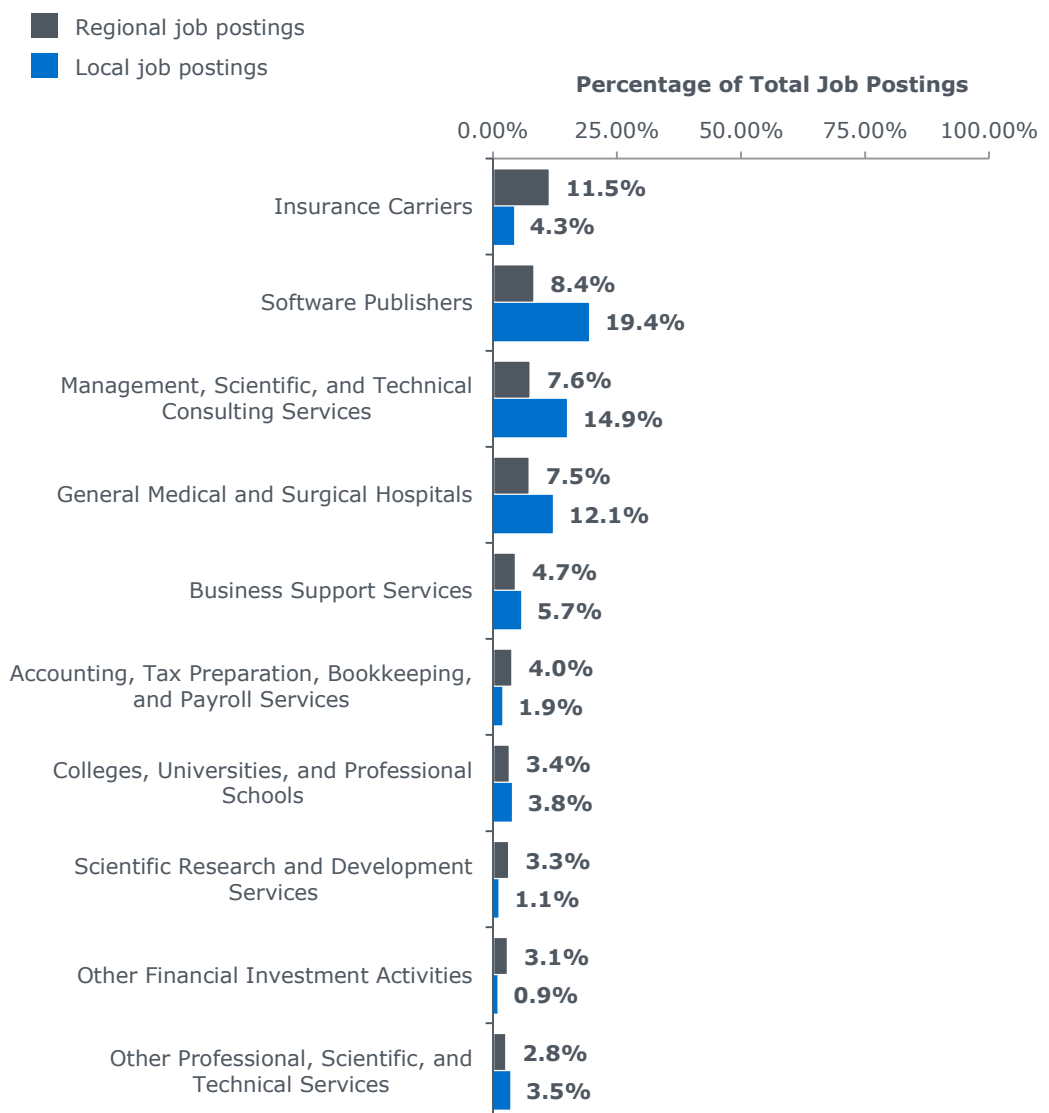
Contacts at profiled programs recall that certificate students hold positions in a variety of industries, particularly technology firms (i.e., Dell), banks (i.e., Bank of America), and consulting companies (i.e., Deloitte). Job postings data also reveals employment opportunities in hospitals, higher education, and scientific research. The span of industries that require data analytics professionals suggests a large population of professionals who may be interested in the proposed certificate program for professional development.

### Distribution of Data Analytics Job Postings across Top Industries

*Local and Regional Data, December 2014-November 2015<sup>4</sup>*

Regional data: n= 24,143 job postings, 9,201 unspecified job postings

Local data: n=3,499 job postings, 1,530 unspecified job postings



4) Burning Glass Labor/Insight™.

## Employer Demand in the Wasatch Front Area Mirrors Demand in the Larger Region

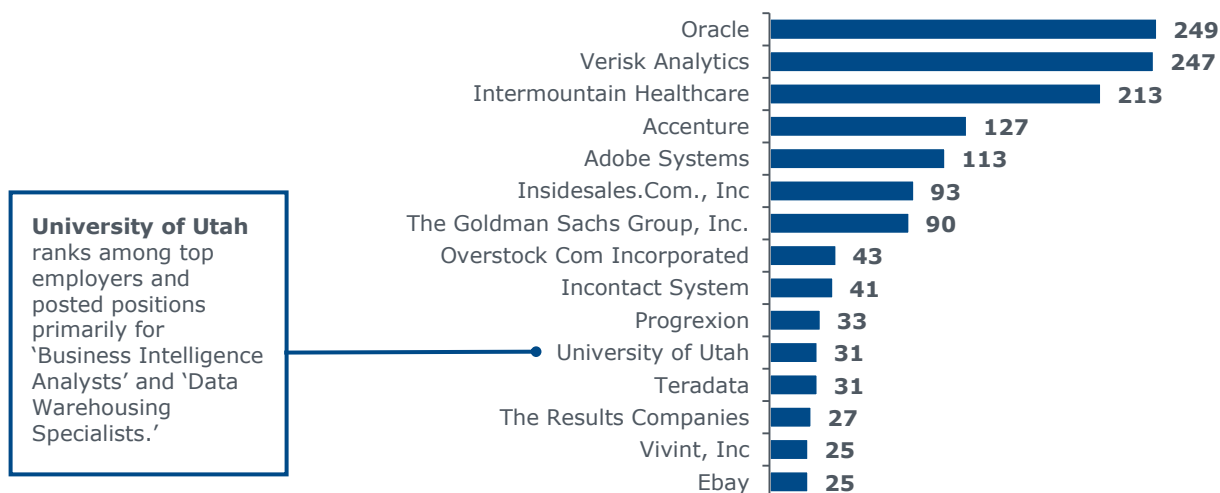
Oracle posted the most open positions for data analytics professionals in both the local area and overall region. Contacts at **Arizona State University** also identify Oracle as a top employer of their certificate program students. The top four local employers (i.e., Oracle, Verisk Analytics, Intermountain Healthcare, and Accenture) all rank as top employers in the larger profiled region.

Contacts at several profiled programs note that a large portion of their students use corporate tuition reimbursement programs to pay program tuition and, therefore, partnerships with local employers to establish such benefits could bolster enrollment in the proposed program. Contacts also observe that many students who take advantage of tuition reimbursement work at large, national corporations that might be more likely to offer such a benefit.

### Top Local Employers for Data Analytics Professionals

*Local Data, December 2014-November 2015<sup>5</sup>*

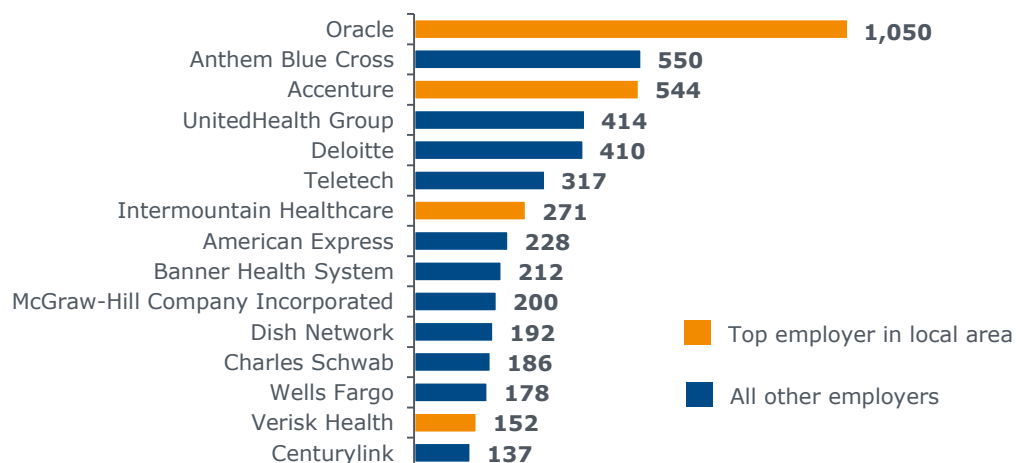
n= 3,499 job postings, 997 unspecified job postings



### Top Regional Employers for Data Analytics Professionals

*Regional Data, December 2014-November 2015<sup>6</sup>*

n= 24,143 job postings, 7,065 unspecified job postings



5) Burning Glass Labor/Insight™.

6) Burning Glass Labor/Insight™.

## Top Locations

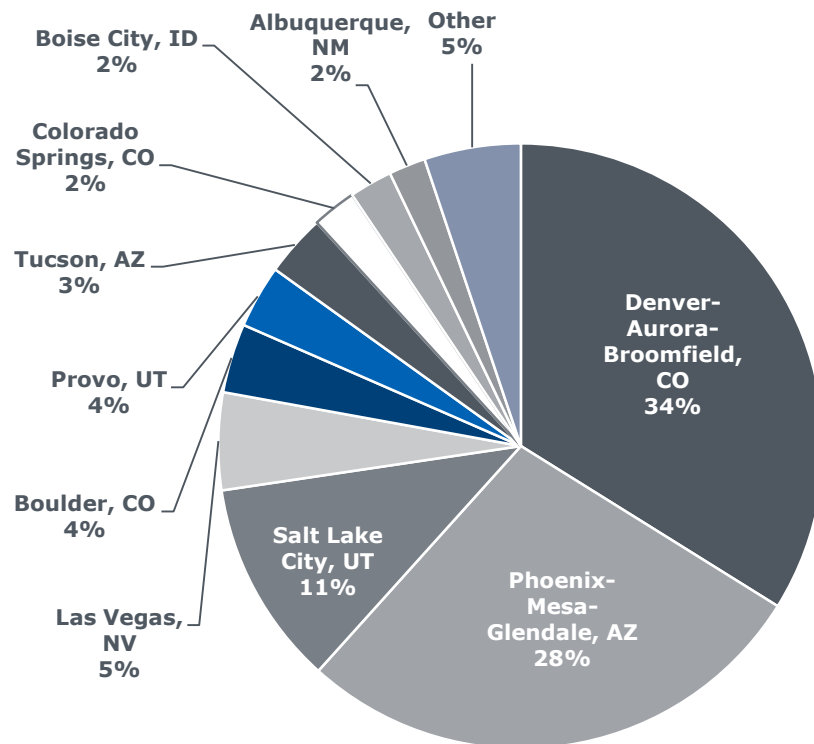
### Salt Lake City and Provo MSAs Post the Most Data Analytics Jobs in Utah

Denver, Phoenix, and Salt Lake City MSAs post the most positions for data analytics professionals in the region. Within the more immediate Wasatch Front area, Salt Lake City and Provo MSAs dominate local employer demand and posted more than 90 percent of all relevant positions. The **University of Utah** should capitalize on this local employer demand and target local data analytics professionals that work at top employers for the proposed certificate program. Also, consider partnerships with local employers (e.g., discounted tuitions) to help market the proposed program to local professionals and better understand what employers look for from such training programs.

### Top MSAs for Data Analytics Professionals in the Profiled Region<sup>7</sup>

*Regional Data, December 2014-November 2015<sup>8</sup>*

n= 24,143 job postings, 1,207 unspecified job postings



7) Appendix B.

8) Burning Glass Labor/Insight™.

## More than Half of Data Analytics Job Postings Advertise Salaries over \$75,000

Of the job postings that list salary information, more than half provide salaries in the highest category (i.e., more than \$75,000) and more than three-quarters provide salaries above \$50,000. The mean local salary (e.g., \$76,742) falls slightly below the mean regional salary (e.g., \$80,456). Further, the Bureau of Labor Statistics indicates top data analytics occupations earn median salaries above \$75,000. Median salaries for these occupations range between \$123,450 for 'marketing managers' and \$61,290 for 'market research analysts and marketing specialists.'

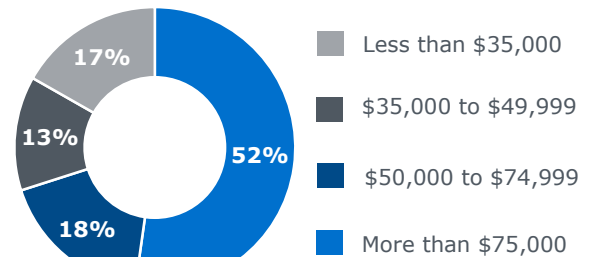
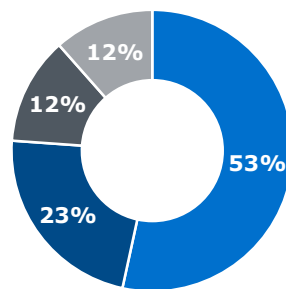
Contacts at the **University of Delaware** also observe that the students in certificate programs tend to have higher reported household incomes than professionals in the University's other continuing education programs. The relatively high salary ranges may be driven by the specialized skills and training required for data analytics employment, as well as by the mid-career status of many data analytics professionals.

### Top Salary Ranges for Data Analytics Professionals<sup>9</sup>

*Regional Data, Dec. 2014-Nov. 2015*  
n=24,143 job postings, 21,868 unspecified

*Local Data, Dec. 2014-Nov. 2015*  
n=3,499 job postings, 3,028 unspecified

Ninety percent of regional job postings and 87 percent of local postings do not specify salaries.



### Median Salaries for Top Data Analytics Occupations

Nine of the top 10 data analytics occupations earn median salaries above \$75,000.

Occupation	Median Salary <sup>10</sup>
Marketing Managers	\$123,450
Computer and Information Systems Managers	\$120,950
Computer Network Architects	\$98,430
General and Operations Managers	\$97,270
Software Developers, Applications	\$95,510
Computer Systems Analysts	\$82,710
Management Analysts	\$80,880
Database Administrators	\$80,280
Financial Analysts	\$78,620
Market Research Analysts and Marketing Specialists	\$61,290

9) Burning Glass Labor/Insight™.

10) Bureau of Labor Statistics.

## Top Titles

### Data Analytics Professionals Primarily Fill Analyst and Engineer Positions

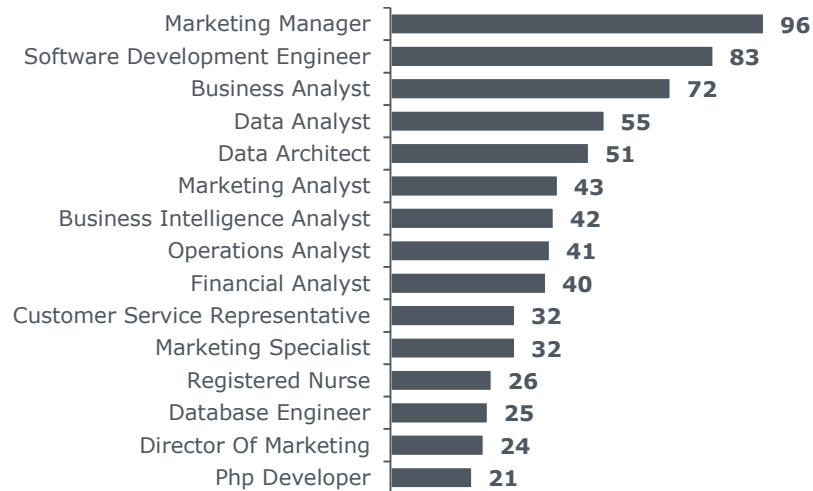
Employer demand data and program contacts indicate that data analyst professionals most commonly fill “analyst” positions, such as ‘business analyst,’ ‘data analyst,’ and ‘marketing analyst.’ Other top titles, such as ‘data architect,’ ‘software development engineer,’ and ‘database engineer,’ suggest that these professionals hold mid- to senior level positions that require specialized skills. Also, management roles, such as ‘marketing manager’ and ‘director of marketing,’ rank among top titles and indicate that data analytics professionals often hold management positions.

Contacts at all profiled programs confirm that certificate students tend to have at least five years of relevant experience, and therefore hold management positions, such as “marketing manager,” or positions that require expert skills, such as “data scientist.” Further, all program contacts identify “analyst” as the most common title for their certificate students.

#### Top Titles for Data Analytics Professionals

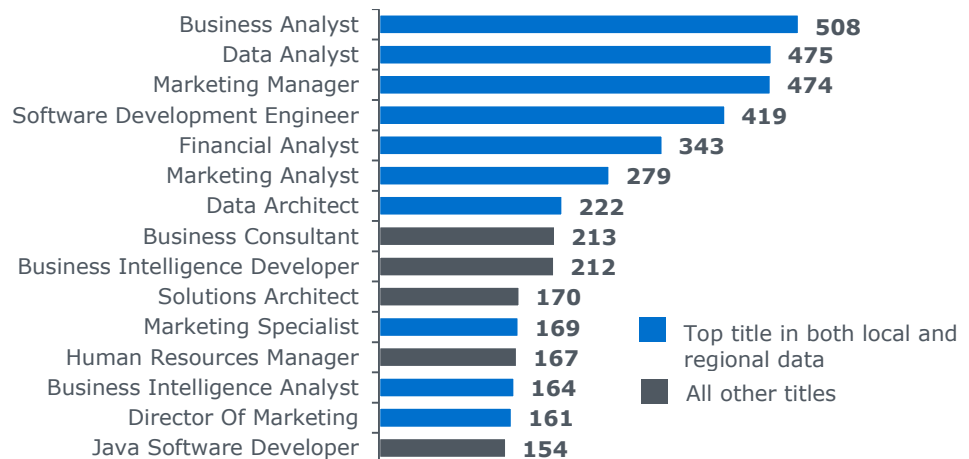
*Local Data, December 2014-November 2015<sup>11</sup>*

n= 3,499 job postings, 1 unspecified job posting



*Regional Data, December 2014-November 2015<sup>12</sup>*

n= 24,143 job postings, 1 unspecified job posting



11) Burning Glass Labor/Insight™.

12) Burning Glass Labor/Insight™.



## Top Skills

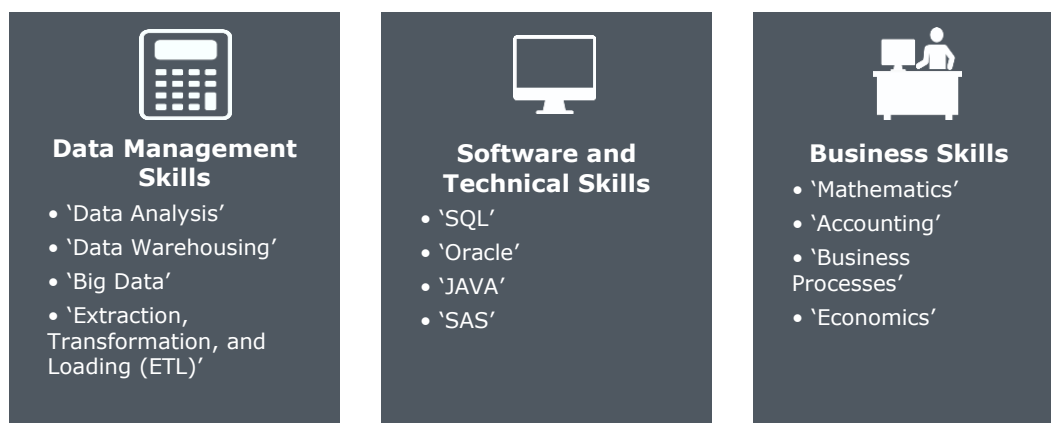
### Employers Seek Data Management, Technical Software Skills, and Business Administration Skills

Job postings data reveals that employers demand professionals with data management skills (e.g., 'data analysis,' 'business intelligence,' 'data warehousing'), technical skills (e.g., 'SQL,' 'Oracle,' 'JAVA'), and more general business skills (e.g., 'mathematics,' 'business process'). While job postings seek professionals with these three types of skills, profiled programs only incorporate courses related to data management.

### Types of Skills in Demand for Data Analytics Professionals

*Regional Data, December 2014-November 2015*<sup>13</sup>

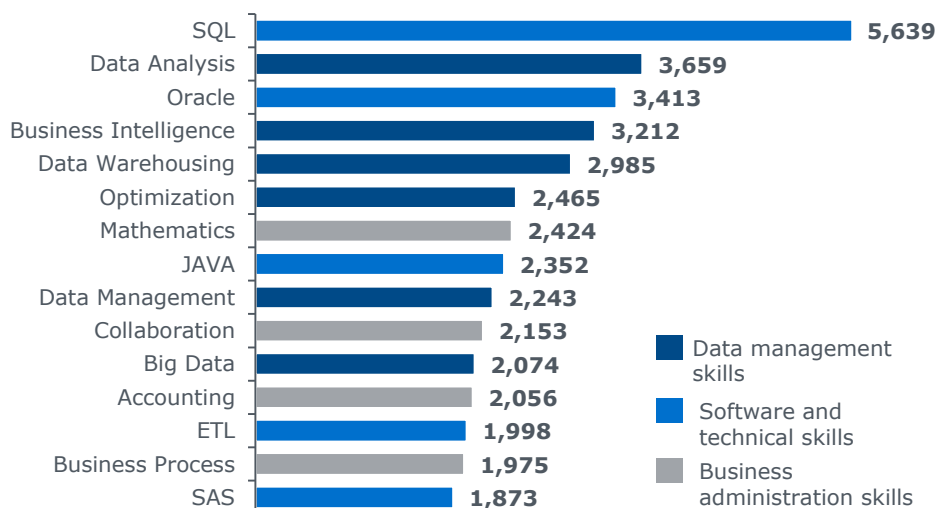
n=24,143 postings, 1,511 unspecified postings



### Top Skills in Demand for Data Analytics Professionals

*Regional Data, December 2014-November 2015*<sup>14</sup>

n=24,143 postings, 1,511 unspecified postings



13) Burning Glass Labor/Insight™.

14) Burning Glass Labor/Insight™.

## 4) Program Design

### Existing Programs

### Data Analytics Certificate Programs Vary in Title and Delivery Format

While programs include comparable amounts of class time, programs range significantly in cost from \$21,384 at **Columbia University** to \$2,795 at the **University of Delaware**. No program contacts could identify an accrediting body or organization for data analytics certificates, and no program websites highlighted any relevant accreditations.

Programs vary in certificate title and include terms such as “data science,” “big data,” “business analytics,” and “data analytics.” Despite the range in titles and industry terms, profiled programs all offer highly similar curricula and overall program structure. Contacts believe this grouping of terms often hold the same meaning in data management industries.

### Characteristics of Profiled Data Analytics Certificate Programs<sup>15</sup>

Institution	Certificate Title	Total Program Tuition	Delivery Format	Number of Courses or Credits Required	Program Length
<b>Columbia University</b>	Certification of Professional Achievement in Data Sciences	\$21,384	Online or on-campus	12 credits	Not specified
<b>Stanford University</b>	Mining Massive Data Sets Graduate Certificate	\$13,440 - \$19,800	Online	4 courses	1-2 years average
<b>Harvard University</b>	Data Science Certificate	\$9,600	Online or on-campus	4 courses	2 years (on average)
<b>University of Maryland University College</b>	Certificate in Foundations in Business Analytics	\$8,328	Online	12 credits	Not specified
<b>Georgetown University</b>	Certificate in Data Science	\$6,560	On-campus	8 courses (10.2 CEUs*)	5 months
<b>University of Delaware</b>	Analytics: Optimizing Big Data Certificate	\$2,795	On-campus	4 courses (4.5 CEUs*)	3 months
<b>Boston University</b>	Graduate Certificate in Data Analytics	Unavailable	Online	3 courses	Not specified

Contacts at the **University of Delaware** believe that data analytics course material would translate well to an online format and note that they offer on-campus delivery only due to limited internal capacity for online course development.

\*Program requires a minimum number of Continued Education Units (CEUs) for certificate completion.

<sup>15</sup>Profiled program websites.

## For-profit Organizations Grant Professional Credentials and Designations Based on Exam Completion

Many for-profit programs and institutions seek to validate professionals' credentials through examinations provided by their organization. Such programs also offer or require related trainings that prepare professionals for the official exams. Exam fees cost at least \$180 per exam, and many certifications require more than one exam. Students may be motivated to take the relevant trainings to avoid failure on exams, since few organizations reimburse students for failed exams. Courses range in cost from \$2,995 for an in-person course with Cloudera to \$6,000 for an in-person course with EMC<sup>2</sup>.

### Characteristics of For-Profit Data Analytics Certificates<sup>16</sup>

Institution	Program Title	Program Features and Requirements	Cost
<b>INFORMS</b>	Certified Analytics Professional (CAP)	<ul style="list-style-type: none"> <li>Exam completion</li> <li>Adherence to INFORM's code of ethics</li> </ul>	• \$495-695 exam fee
<b>Coursera</b>	Make Data-Driven Business Decisions	<ul style="list-style-type: none"> <li>4 courses</li> <li>Capstone project</li> </ul>	• \$595 total
<b>INSOFE*</b>	Certificate Program in Big Data Analytics and Optimization	<ul style="list-style-type: none"> <li>10 courses series</li> <li>Capstone project</li> </ul>	• \$3,850 + tax
<b>EMC<sup>2</sup></b>	Data Scientist Associate Certification	<ul style="list-style-type: none"> <li>Exam</li> <li>Online and in-person courses</li> </ul>	<ul style="list-style-type: none"> <li>\$3,000-6,000 per course</li> <li>\$200 fee per exam</li> </ul>
<b>Cloudera</b>	<ul style="list-style-type: none"> <li>Cloudera Certified Professional: Data Scientist</li> <li>Cloudera Certified Developer for Apache Hadoop</li> </ul>	<ul style="list-style-type: none"> <li>Trainings</li> <li>Exam</li> <li>Capstone project</li> </ul>	<ul style="list-style-type: none"> <li>\$2,995 per course</li> <li>Exam fees vary</li> </ul>
<b>Hewlett Packard Enterprise</b>	Vertica Big Data Solutions VI Certification	<ul style="list-style-type: none"> <li>Exam</li> <li>Optional related trainings</li> </ul>	Unavailable
<b>Oracle Partner Network</b>	Oracle Business Intelligence Foundation Certification	<ul style="list-style-type: none"> <li>Exam</li> </ul>	• \$245 exam fee
<b>Institute for the Certification of Computing Professionals (ICCP)</b>	Certified Data Professional (CDP) Certificate	<ul style="list-style-type: none"> <li>Three ICCP exams</li> </ul>	• \$189-299 fee per exam
<b>SAP</b>	SAS Global Certification Program (nine credentials available)	<ul style="list-style-type: none"> <li>Exam</li> </ul>	• \$180 fee per exam

\*International School of Engineering

Coursera's certificate represents the only for-profit program comprised only of courses and no exam requirement. The program was created in partnership with the **University of Pennsylvania**.

<sup>16</sup>Profiled program websites.

## Profiled Programs' Curricula Primarily Confer Data Management Skills in Required Courses

Profiled certificate programs all require similar courses for certificate completion (e.g., data visualization, machine learning, data science) and most curricula focus primarily on data management skills (i.e., 'data analysis,' 'business intelligence,' and 'data warehousing'), rather than attempt to confer all skills in demand in a relatively brief certificate program.

**Harvard University, Columbia University, and Boston University** all require four courses for certificate completion. While Harvard University offers a wide variety of courses and allows students to choose electives, most profiled programs (i.e., Boston University, **Stanford University, Georgetown University, and University of Maryland University College**) only offer required courses.

### Common Courses Required for Data Analytics Certificates<sup>17</sup>

Course Topic	Data Mining	Data Visualization	Machine Learning	Data Science	Statistics	Predictive Analysis	Big Data
Harvard University	✓	✓	✓	✓			✓
Columbia University		✓	✓	✓	✓		
Arizona State University	✓					✓	✓
Georgetown University			✓	✓	✓		
Stanford University	✓		✓			✓	
Boston University	✓	✓					
University of Maryland University College	✓	✓					

17) Program websites.

## Employ Case Studies, Capstone Projects, and Pre-Course Study Requirements to Ensure Students Possess Skills in Demand by Regional Employers

Employer demand data reveals three types of skills for critical for data analytics professionals (i.e., data management, technical and software skills, and business skills), but most profiled programs only confer data management skills (i.e., “data visualization” or “big data”) and incorporate other skills through the following methods:

- **Business skills:** Use case studies and capstone projects to ensure students receive exposure to business skills during the certificate. Also, most students have prior work experience and may already possess these competencies.
- **Technical and software skills:** Profiled programs emphasize the importance of prior technical skills (i.e., SQL and Python languages) and encourage or require students to explore prerequisite courses if they lack familiarity with these programs.

### Profiled Certificate Programs Enroll Mid-Career Working Professionals with Work Experience and Master's Degrees

Contacts remark that certificate students almost always complete data analytics certificates on a part-time basis, and these working professionals typically have at least five years of relevant work experience. Further, these students typically hold master's degrees in technology and seek this certificate as an additional credential to excel in their current position.

#### Common Characteristics of Data Analytics Certificate Students



# Appendix A: Networking Contacts

---

## **Arizona State University**

Joel Dupuis

*Key Account Director*

480-727-6275

[joel.dupuis@asu.edu](mailto:joel.dupuis@asu.edu)

## **Colorado State University**

Jana Anderson

*Director of Online Learning/MAS Programs*

970-491-7454

[anderson@stat.colostate.edu](mailto:anderson@stat.colostate.edu)

## **Georgetown University**

Monique Hawkins

*Assistant Director, Enrollment Management*

202-784-7321

[mh1482@georgetown.edu](mailto:mh1482@georgetown.edu)

## **University of Delaware**

Tara White Kee, PhD

*Marketing Manager*

302-831-1178

[twkee@udel.edu](mailto:twkee@udel.edu)

## Appendix B: PAC-12 Competitor Landscape

Of the institutions in the Pac-12 conference, 8 offer a data analytics certificate programs similar to the proposed program at the **University of Utah**. The **University of Colorado—Boulder**, the **University of Oregon**, and **Washington State University** currently do not offer a comparable certificate program.

### Common Courses in Data Analytics Certificates to Confer Employer Demanded Skills<sup>18</sup>

Institution	Data Visualization	Machine Learning	Data Science	Data Mining	Statistics	Predictive Analysis	Big Data
University of California, Berkeley	✓	✓	✓	✓		✓	✓
University of Southern California	✓	✓	✓	✓	✓	✓	
Oregon State University	✓		✓	✓			✓
Arizona State University	✓					✓	✓
Stanford University				✓	✓		
University of Washington			✓				✓
University of California—Los Angeles	✓		✓				
University of Arizona				✓		✓	

18) Burning Glass Labor/Insight™ and program websites.



# Appendix C: Top Local Employers' Data

## Oracle

### Top Skills of Professionals with Data Analytics Skills

January-December 2015, Local Data<sup>19</sup>

n=249 job postings, 0 unspecified postings



### Top Titles of Professionals with Data Analytics Skills

January-December 2015, Local Data<sup>2</sup>

n=249 job postings, 0 unspecified postings

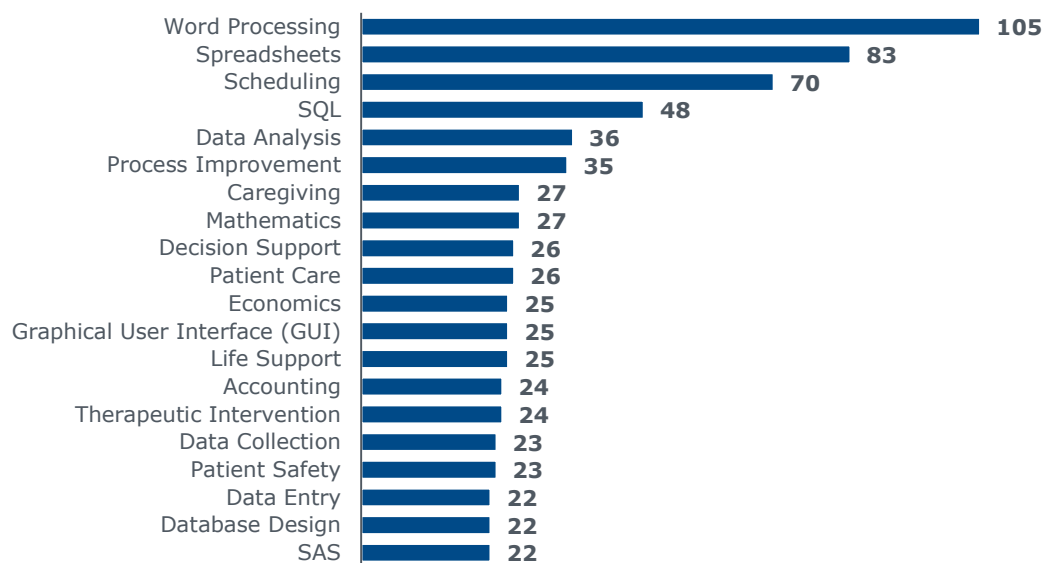


19) Burning Glass Labor/Insight™.

## Top Skills of Professionals with Data Analytics Skills

January-December 2015, Local Data<sup>20</sup>

n=213 job postings, 0 unspecified postings



## Top Titles of Professionals with Data Analytics Skills

January-December 2015, Local Data<sup>3</sup>

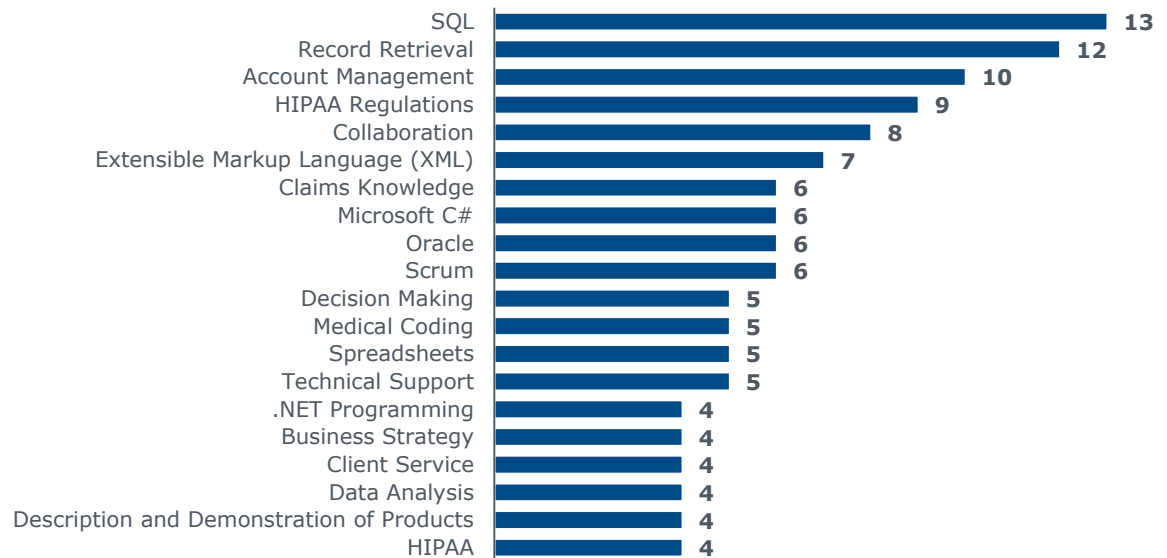
n=213 job postings, 0 unspecified postings



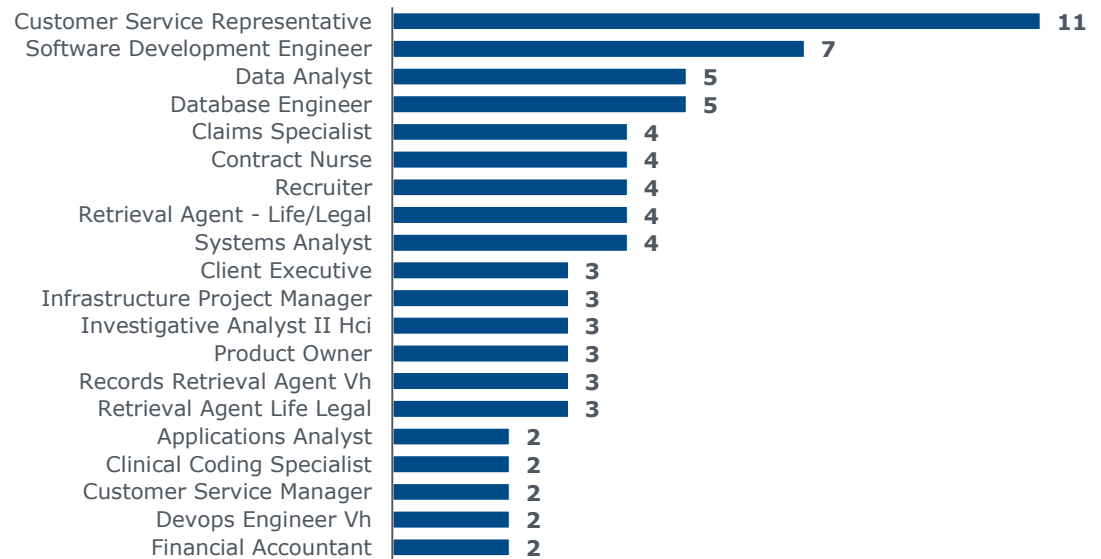
20) Burning Glass Labor/Insight™.

**Top Skills of Professionals with Data Analytics Skills***January-December 2015, Local Data<sup>21</sup>*

n=147 job postings, 72 unspecified postings

**Top Titles of Professionals with Data Analytics Skills***January-December 2015, Local Data<sup>4</sup>*

n=147 job postings, 0 unspecified postings



21) Burning Glass Labor/Insight™.

# Appendix D: Top Regional Employers' Data

## Oracle

### Top Skills of Professionals with Data Analytics Skills

January-December 2015, Regional Data<sup>22</sup>

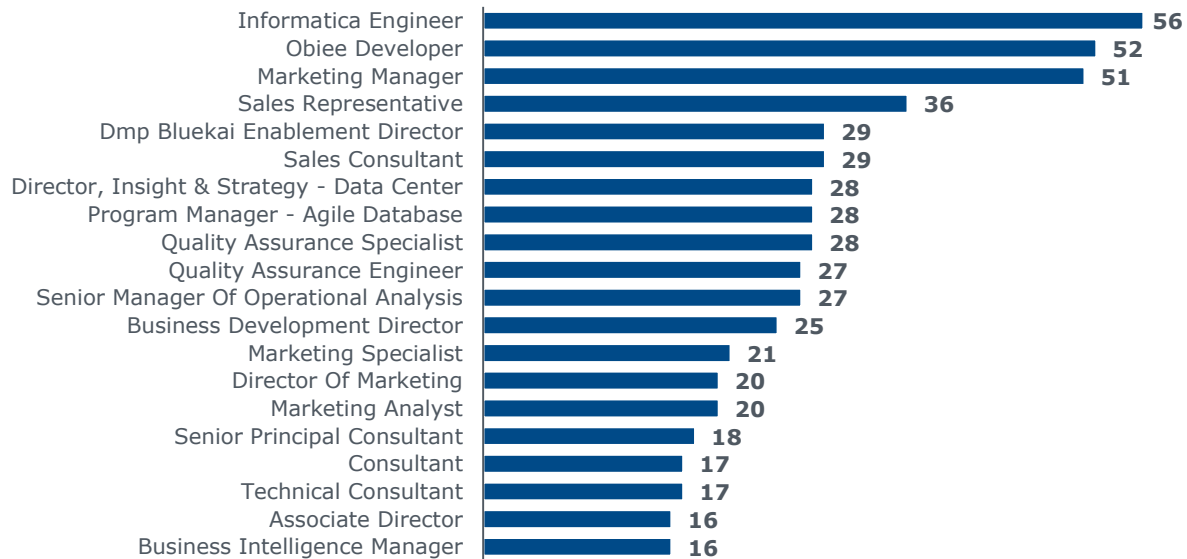
n=1,050 job postings, 4 unspecified postings



### Top Titles of Professionals with Data Analytics Skills

January-December 2015, Regional Data<sup>5</sup>

n=1,050 job postings, 0 unspecified postings

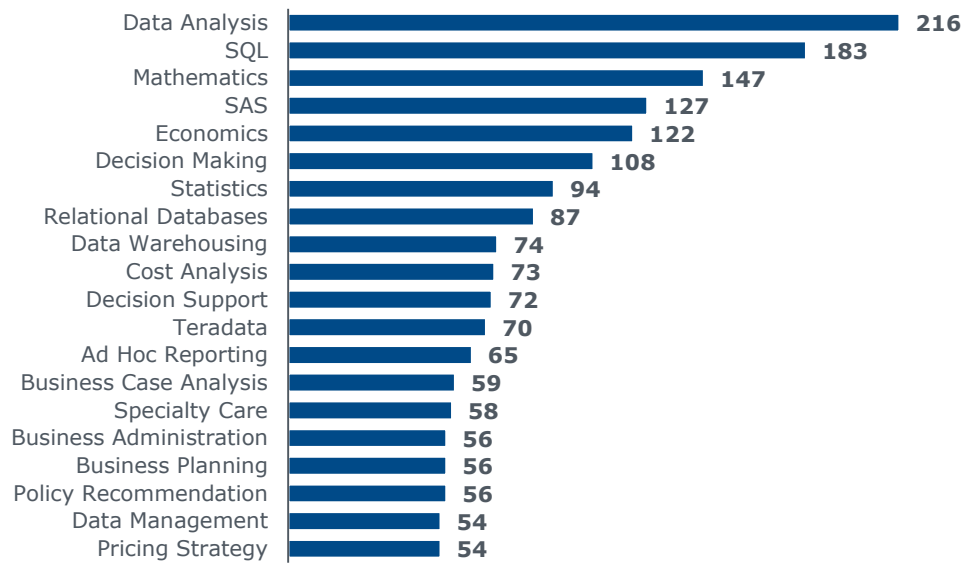


22) Burning Glass Labor/Insight™.

## Top Skills of Professionals with Data Analytics Skills

January-December 2015, Regional Data<sup>23</sup>

n=550 job postings, 16 unspecified postings



## Top Titles of Professionals with Data Analytics Skills

January-December 2015, Regional Data<sup>6</sup>

n= 550 job postings, 0 unspecified postings



\*Business Intelligence Solutions Engineer Senior Advisor or Executive Advisor

\*\*Staff Vice President Business Solutions - Clinical Analytic Products

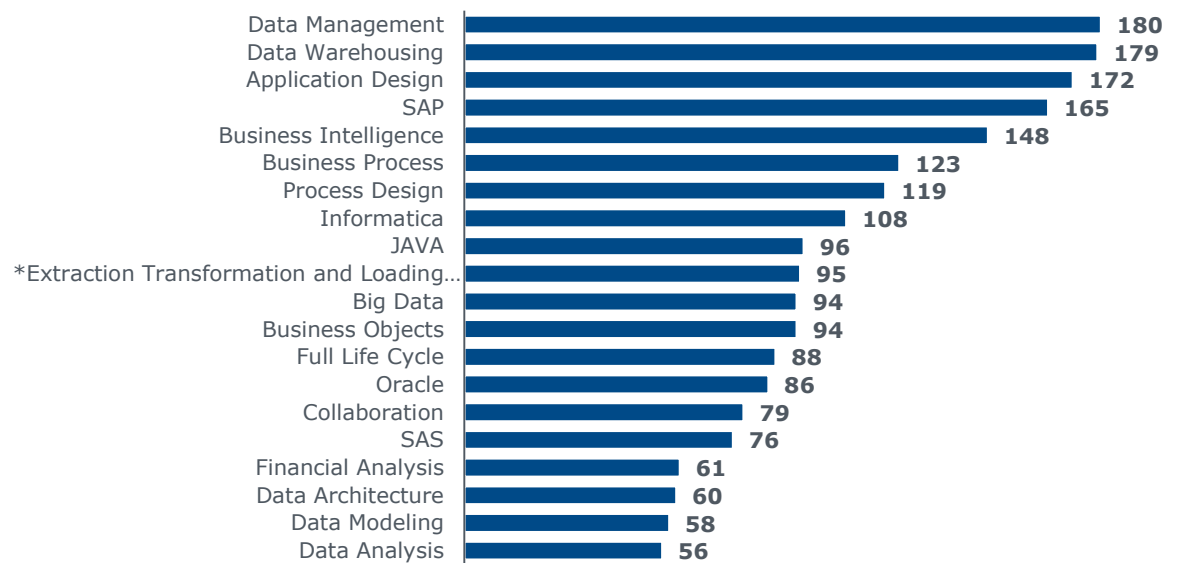
\*\*\*Staff Vice President Technology Data & Systems Analysis

\*\*\*\*Business Change Director - Provider Incentive Program - Sk

## Top Skills of Professionals with Data Analytics Skills

January-December 2015, Regional Data<sup>24</sup>

n=544 job postings, 0 unspecified postings



\*Extraction Transformation and Loading (ETL)

## Top Titles of Professionals with Data Analytics Skills

January-December 2015, Regional Data<sup>7</sup>

n= 544 job postings, 0 unspecified postings



\*Informatica Mdm Digital Integration Manager

\*\*Health Payer Mc Claims Operations & Payment Integrity Manager

# Market Overview for Masters in Public Policy

## Executive Summary

Leadership at the University of Utah College of Social and Behavioral Science approached UOnline as they considered launching an online Masters of Public Policy (MPP).

This market overview has three recommendations:

- 1) Development of an online graduate certificate in public policy to serve as both a pipeline to the program for Utah-based working professionals and as a standalone professional credential for career development or add-on for current graduate students.
- 2) Continued integration of quantitative and qualitative analytics into the MPP program for broader sector employability.
- 3) Focus on competitive distinctions between both Masters in Public Administration (MPA) and Masters in Business Administration (MBA) programs.

This presentation summarizes western U.S. and regional MSA market information and explores both the supply side (regional and University of Utah public policy completions) and demand side (labor market) related to the potential success of a online masters in public policy program.

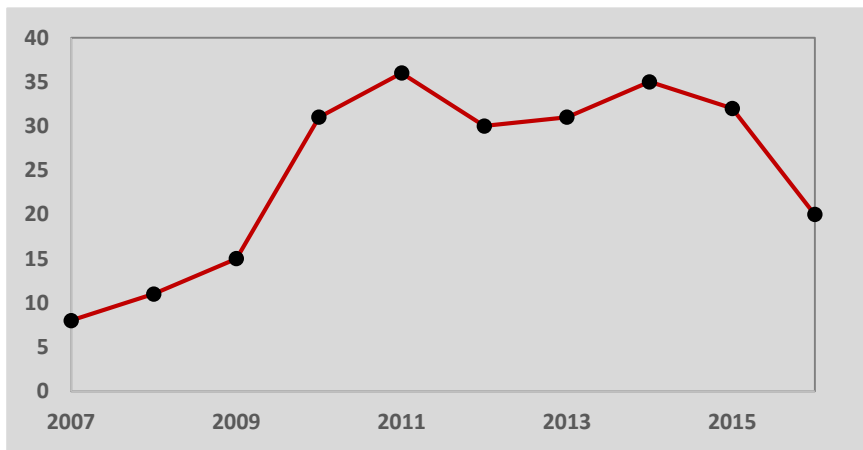
## Key Observations

- 1) Public policy is a specialized graduate degree with a variety of outcomes by sector and industry.
- 2) California accounted for approximately 75% of all public policy program completions in 2015 and 50% of the degree or certificate granting institutions in the last 13 years.
- 3) Demand in the Western U.S. for masters in public policy graduates is estimated at 11,200 unique jobs from June 2015-May 2016.
- 4) Regional MSA demand for masters in public policy graduates is estimated at 1,600 unique jobs from June 2015-May 2016.
- 5) University of Utah masters in public policy graduates have above average state employment outcomes, implying potential weakness in the labor market or competitive positioning with other candidates.

# Supply Side Analysis: University of Utah MPP Completions

## University of Utah Enrollment

Based on University of Utah OBIA Data on Demand, spring end of term enrollment for the masters in public policy is illustrated below.

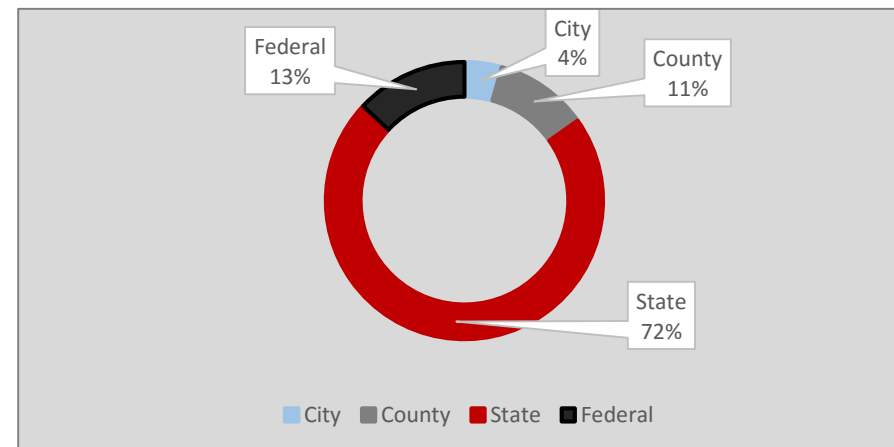
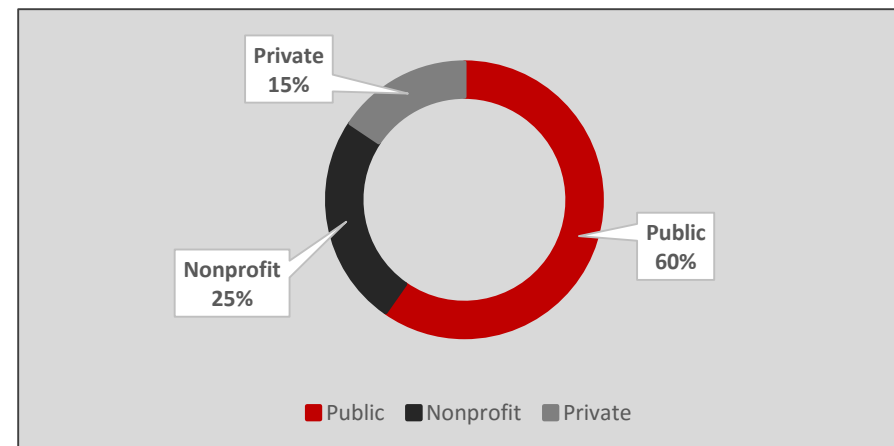


60%

Greater than 60% of all University of Utah MPP graduates are in an analyst role. These positions include policy analyst and research analyst.

## Employment Sector Distribution

Based on MPP graduate surveys, distributions of employment by overall sector and specific to the public sector are shown below.

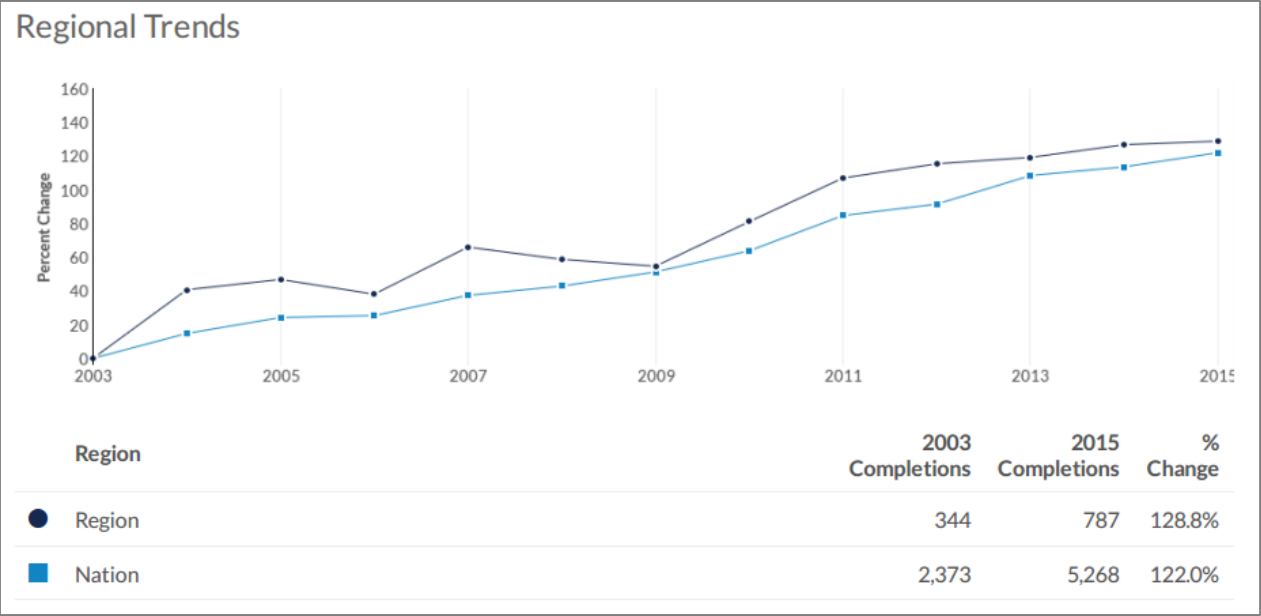




# Supply Side Analysis: Regional Completions in Public Policy Analysis

787

Total regional program completions in public policy for all degree levels (including certificates) for the western United States in 2015. The top states for masters graduates are California, Oregon, and Washington.



8

University of Utah ranked 8<sup>th</sup> in regional program completions in public policy at the masters level in 2015. For all public policy completions, including certificates, Utah ranked 13<sup>th</sup>.

36 regional institutions had completions in the last 13 years.

## Regional Completions by Award Level



Award Level	Completions (2015)	Percent
Bachelors degree	229	29.1%
Postbaccalaureate certificate	38	4.8%
Masters degree	482	61.2%
Doctors degree	38	4.8%

# Supply Side Analysis: Competitive Overview

## Top 6 Institutions by Completions

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The following list is a rank of institutions by masters completions in public policy in 2015.

- 1) USC (105)
- 2) UC-Berkeley (79)
- 3) UCLA (56)
- 4) Pepperdine (47)
- 5) Oregon State (34)
- 6) Stanford (25)

## California

---

California accounted for approximately 75% of all public policy program completions in 2015 and 50% of the degree or certificate granting institutions in the last 13 years.

UC-Berkeley (Goldman) is the #1 ranked public policy analysis graduate program in the U.S. USC Price (#11) and UCLA Luskin (#19) are the other California programs ranked in the top 20.

## The West

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Washington Evans (#12), ASU (#22), and Stanford (#33) are the other west region institutions ranked in the top 35 graduate programs.

## Online

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American University (#26) and North Carolina (#33) are the only institutions with online MPP offerings ranked in the top 35 public policy analysis graduate programs.

# Demand Side Analysis: Western US Labor Market Analysis

11,200

Given a set of public policy occupations and conservative weighting of broader occupation types, there were approximately 11,200 unique job postings in the western U.S. region applicable to the public policy field from June 2015 to May 2016.

Public policy is a specialized graduate degree with a variety of outcomes by sector (public, nonprofit, and private) and industry (policy research, health, education, finance, public administration, energy, etc.)

This labor market figure is mapped to ten different occupation codes such as social scientist, management analyst, urban and regional planner, economist, survey researcher, and budget analyst. Broader types of occupations, such as market research or operations research, are weighed more conservatively.

The geographic parameter is the western U.S. (AZ, CA, CO, ID, MT, NM, NV, OR, UT, WA, WY).

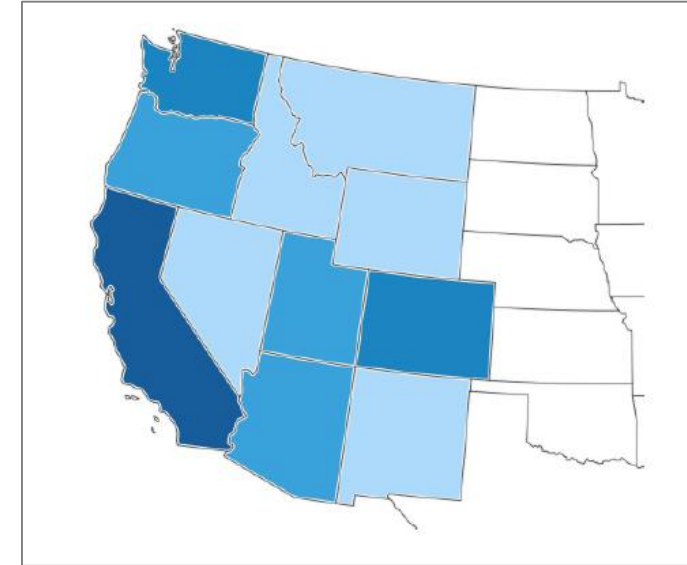
## Top 6 Cities

The following list is rank of top cities by job posting.

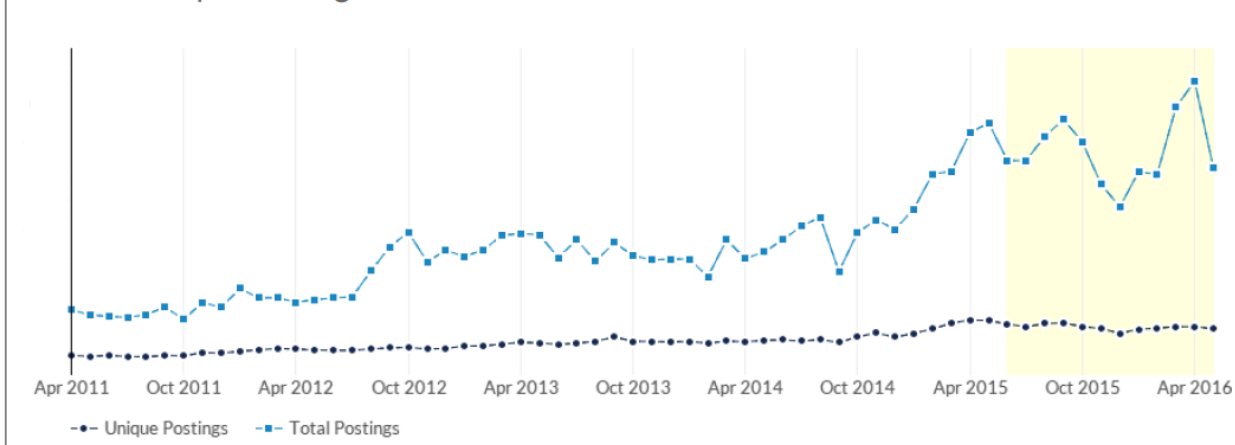
- |                      |                  |
|----------------------|------------------|
| 1) San Francisco, CA | 4) Denver, CO    |
| 2) Los Angeles, CA   | 5) San Diego, CA |
| 3) Seattle, WA       | 6) Phoenix, AZ   |

## Analysis In-Demand

Analysis, data analysis, and analytics are highly ranked concentrated hard skills in job postings.



Total vs. Unique Postings Trend



# Demand Side Analysis: Regional Markets

1,600

---

Given a set of public policy occupations and conservative weighting of broader occupation types, there were approximately 1,600 unique job postings in the regional market applicable to the public policy field from June 2015 to May 2016.

The geographic parameter is the Denver, Phoenix, and Salt Lake City metropolitan statistical areas (MSAs).

## Top Companies

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A sample of top companies include Oracle, United Healthcare, Deloitte, DaVita, University of Utah, and Zions Bank.

## Top 6 MSAs

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The following list is rank of top cities by job posting. Denver and Phoenix demand outweighs Salt Lake by a factor of 3.

- 1) Denver-Aurora-Lakewood, CO
- 2) Phoenix-Mesa-Scottsdale, AZ
- 3) Salt Lake City, UT

