C·O·E CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

Program Endorsement Brief: 0702.00/Computer Information Systems
Big Data Analytics for Business
Los Angeles/Orange County Center of Excellence, April 2021

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met	☐	Endorsed: Some Criteria Met	☒	Not Endorsed	☐
Program Endorsement Criteria						
Supply Gap:	Yes ☑				No ☐	
Living Wage: (Entry-Level, 25th)	Yes ☑				No ☐	
Education:	Yes ☐				No ☑	
Emerging Occupation(s)						
Yes ☑					No ☐	

The Los Angeles/Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to four occupations present within the field of big data analytics for business: *computer systems analysts* (15-1211), *database administrators and architects* (15-1245), *computer occupations, all other* (15-1299), and *data scientists and mathematical science occupations, all other* (15-2098), and one emerging occupation: *business intelligence analysts* (15-1199.08). Currently, there is not a standard occupational classification (SOC) code for a middle-skill occupation in the field of big data analytics. While the occupations in this report typically require a bachelor's degree and are not traditionally considered middle-skill, these occupations are most closely aligned with the knowledge, skills and abilities required for an entry-level job seeker in the emerging field of both big data analytics for business. This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for these big data analytics for business occupations in the region. While these occupations have typical entry-level wages that exceed the living wage in both Los Angeles and Orange counties, each of these occupations typically requires a bachelor's degree. **Therefore, due to some of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

Demand:
- *Supply Gap Criteria* – Over the next five years, there is projected to be **3,481 jobs available annually** in the region due to new job growth and replacements, **which is more than the 1,991 awards conferred annually** by educational institutions in the region.
  - Not every worker in these computer roles will be engaged in work involving big data analytics for business; therefore, *the demand is overstated.*

- *Living Wage Criteria* – Within Los Angeles County, all of the annual job openings for these occupations related to big data analytics for business have entry-level wages above the county's living wage ($15.04/hour).[1]
- *Educational Criteria* – The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for these occupations related to big data analytics for business.
    - Furthermore, the national-level educational attainment data indicates **between 11.2% and 27.2% of workers in the field have completed some college or an associate degree.**

Supply:
- There are **25 community colleges** in the LA/OC region that issue information technology awards in fields related to big data analytics for business, conferring an average of **584 awards annually** between 2016 and 2019.
- Between 2014 and 2017, there was an average of **1,407 awards conferred annually** in related training programs by non-community college institutions throughout the region.
    - The programs summarized in this report are not grounded solely in big data analytics for business; therefore, *the supply in this report is also overstated.*

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for the four occupations in this report related to big data analytics for business. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 3% through 2024. There will be more than 3,500 job openings per year through 2024 due to job growth and replacements.

This report includes employment projection data by Emsi, which uses EDD information. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties[2]

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	33,355	34,108	753	2%	2,409
Orange	14,561	15,014	452	3%	1,072
Total	**47,916**	**49,122**	**1,205**	**3%**	**3,481**

---

[1] Living wage data was pulled from California Family Needs Calculator on 4/14/2021. For more information, visit the California Family Needs Calculator website: https://insightcced.org/2018-family-needs-calculator/.
[2] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Wages

The labor market endorsement in this report considers the entry-level hourly wages for the occupations in this report in Los Angeles County as they relate to the county's living wage. Orange County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

Los Angeles County— All of the annual openings for these big data analytics for business occupations have entry-level wages above the living wage for one adult ($15.04 in Los Angeles County). Typical entry-level hourly wages are in a range between $27.21 and $38.23. Experienced workers can expect to earn wages between $53.77 and $71.11, which are higher than the living wage estimate. Los Angeles County's average wages are below the average statewide wage of $51.60 for these occupations.

Orange County— All of the annual openings for these big data analytics for business occupations have entry-level wages above the living wage for one adult ($17.36 in Orange County). Typical entry-level hourly wages are in a range between $26.40 and $37.16. Experienced workers can expect to earn wages between $52.12 and $67.85, which are higher than the living wage estimate. Orange County's average wages are below the average statewide wage of $51.60 for these occupations.

Job Postings

There were 17,083 online job postings related to big data analytics for business, including the emerging occupation *business intelligence analysts* (15-1199.08), listed in the past 12 months. The highest number of job postings were for data analysts, business systems analysts, data engineers, senior data engineers, and business information analysts. The top skills were SQL, data analysis, Python, project management, and business process. The top three employers, by number of job postings, in the region were Anthem Blue Cross, The Boeing Company, and Northrop Grumman.

It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.

Educational Attainment

The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for all four of the big data analytics for business occupations in this report. Furthermore, the national-level educational attainment data indicates between 11.2% and 27.2% of workers in the field have completed some college or an associate degree as their highest level of education, while between 65.8% and 88% of workers hold a bachelor's degree or more education. Of the 61% of big data analytics for business job postings listing a minimum education requirement in Los Angeles/Orange County, 89% (9,283) requested a bachelor's degree, 8% (791) requested a high school diploma and 3% (341) requested an associate degree.

Educational Supply

Community College Supply—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Information Technology, General

(0701.00), Computer Information Systems (0702.00), Computer Systems Analysis (0707.30), Computer Networking (0708.10), Computer Support (0708.20), and Other Information Technology (0799.00. The colleges with the most completions in the region are Mt. San Antonio, West LA, and Long Beach. Over the past 12 months, there were twenty-one other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2016-2019

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
0701.00	Information Technology, General	East LA	8	15	23	15
		LA Harbor	7	6	-	4
		LA Mission	4	1	1	2
		Long Beach	27	25	34	29
		Mt San Antonio	61	79	74	71
		Santa Monica	-	-	39	13
		West LA	3	4	4	4
		LA Subtotal	**110**	**130**	**175**	**138**
		Cypress	1	-	-	0
		OC Subtotal	**1**	**0**	**0**	**0**
	Supply Subtotal/Average		**111**	**130**	**175**	**139**
0702.00	Computer Information Systems	Citrus	5	7	5	6
		Compton	1	-	1	1
		East LA	14	16	19	16
		El Camino	15	18	14	16
		Glendale	2	-	-	1
		LA City	3	4	1	3
		LA Mission	3	9	5	6
		LA Trade	23	14	8	15
		Pasadena	2	1	-	1
		Rio Hondo	10	19	21	17
		West LA	13	6	8	9
		LA Subtotal	**91**	**94**	**82**	**89**
		Cypress	5	8	5	6
		Fullerton	7	20	15	14
		Orange Coast	-	3	4	2
		Santa Ana	18	6	4	9
		Santiago Canyon	2	2	3	2
		OC Subtotal	**32**	**39**	**31**	**34**

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
		Supply Subtotal/Average	123	133	113	123
0707.30	Computer Systems Analysis	Cerritos	6	4	2	4
		LA Subtotal	**6**	**4**	**2**	**4**
		Cypress	-	5	2	2
		OC Subtotal	**0**	**5**	**2**	**2**
		Supply Subtotal/Average	6	9	4	6
0708.10	Computer Networking	Cerritos	10	8	11	10
		Glendale	-	6	3	3
		LA City	11	37	23	24
		LA Pierce	37	23	39	33
		Long Beach	25	27	55	36
		Mt San Antonio	9	2	8	6
		Rio Hondo	-	-	5	2
		West LA	52	43	77	57
		LA Subtotal	**144**	**146**	**221**	**170**
		Coastline	20	12	38	23
		Cypress	28	37	70	45
		Irvine	19	12	11	14
		Saddleback	21	17	10	16
		Santa Ana	-	7	14	7
		OC Subtotal	**88**	**85**	**143**	**105**
		Supply Subtotal/Average	232	231	364	276
0708.20	Computer Support	Glendale	2	3	10	5
		LA Pierce	14	7	9	10
		Long Beach	-	1	8	3
		Pasadena	1	3	7	4
		LA Subtotal	**17**	**14**	**34**	**22**
		Cypress	3	1	3	2
		Santa Ana	-	10	9	6
		OC Subtotal	**3**	**11**	**12**	**9**
		Supply Subtotal/Average	20	25	46	30
0799.00	Other Information Technology	LA Harbor	1	1	-	1
		Mt San Antonio	9	5	13	9
		LA Subtotal	**10**	**6**	**13**	**10**
		Supply Subtotal/Average	10	6	13	10

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
		Supply Total/Average	**502**	**534**	**715**	**584**

Non-Community College Supply—For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for big data analytics for business. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Computer and Information Sciences, General (11.0101), Information Technology (11.0103), Computer and Information Sciences, Other (11.0199), Computer Systems Analysis/Analyst (11.0501), Computer Software and Media Applications, Other (11.0899), Computer Systems Networking and Telecommunications (11.0901), Network and Systems Administration/Administrator (11.1001), System, Networking, and LAN/WAN Management/Manager (11.1002), Computer and Information Systems Security/Information Assurance (11.1003), Information Technology Project Management (11.1005), Computer Support Specialist (11.1006), Computer/Information Technology Services Administration and Management. Other (11.1099), Computer and Information Sciences and Support Services, Other (11.9999), and Computer Technology/Computer Systems Technology (15.1202). Due to different data collection periods, the most recent three-year period of available data is from 2014 to 2017. Between 2014 and 2017, four-year colleges in the region conferred an average of 1,407 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2014-2017

CIP Code	Program	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Year Award Average
11.0101	Computer and Information Sciences, General	ABCO Technology	15	-	-	5
		Azusa Pacific University	10	20	19	16
		Brand College	1	2	-	1
		Brandman University	19	14	26	20
		California Institute of Technology	48	56	-	35
		Chapman University	6	7	5	6
		Loyola Marymount University	15	16	19	17
		Pacific States University	-	2	1	1
		University of California-Irvine	31	3	1	12
		University of La Verne	14	21	19	18
		University of the People	-	36	57	31
11.0103	Information Technology	Argosy University-Orange County	-	1	-	0
		Bethesda University	1	1	-	1
		Brand College	55	42	28	42
		California Intercontinental Univ.	-	-	1	0
		CSU-Los Angeles	102	92	117	104

CIP Code	Program	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Year Award Average
		CSU-Northridge	49	48	43	47
		Stanbridge University	29	21	25	25
		Trident University International	96	77	74	82
		University of Phoenix-California	2	3	16	7
11.0199	Computer and Information Sciences, Other	Antioch University-Los Angeles	-	-	20	7
		Brand College	1	4	2	2
		CSU-Dominguez Hills	32	36	66	45
		CSU-Northridge	30	50	77	52
		Learnet Academy	40	-	-	13
		Pitzer College	1	-	-	0
11.0501	Computer Systems Analysis/Analyst	Brand College	1	2	4	2
		DeVry University-California	110	103	94	102
		University of Phoenix-California	9	8	4	7
11.0899	Computer Software and Media Applications, Other	Art Center College of Design	-	5	7	4
		Learnet Academy	59	45	41	48
11.090	Computer Systems Networking and Telecommunications	Advanced Computing Institute	6	5	98	36
		Brand College	-	1	2	1
		DeVry University-California	166	154	135	152
		ITT Technical Institute-Sylmar	1	-	-	0
		Mt Sierra College	8	6	5	6
		PCI College	1	-	-	0
		University of Phoenix-California	51	55	27	44
11.1001	Network and System Administration/ Administrator	Brand College	16	22	2	13
		University of Phoenix-California	12	2	1	5
11.1002	System, Networking, and LAN/WAN Management/ Manager	ABCO Technology	-	16	10	9
		ITT Technical Institute-Orange	78	-	-	26
		ITT Technical Institute-San Dimas	43	-	-	14
		ITT Technical Institute-Sylmar	48	-	-	16
		ITT Technical Institute-Torrance	50	-	-	17
11.1003	Computer and Information Systems Security/ Information Assurance	Azusa Pacific University	8	4	3	5
		ITT Technical Institute-Orange	37	-	-	12
		ITT Technical Institute-San Dimas	23	-	-	8
		ITT Technical Institute-Sylmar	19	-	-	6
		ITT Technical Institute-Torrance	6	-	-	2

CIP Code	Program	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Year Award Average
		Learnet Academy	-	39	48	29
		Mt Sierra College	14	9	8	10
		University of Phoenix-California	111	74	71	85
11.1005	Information Technology Project Management	California Intercontinental Univ.	-	-	2	1
11.1006	Computer Support Specialist	Palladium Technical Academy	6	-	-	2
		Southern California Institute of Tech.	13	32	16	20
		University of Phoenix-California	-	-	1	0
11.1099	Computer/ Information Technology Services Administration and Management, Other	ABCO Technology	3	9	4	5
		Advanced Computing Institute	5	5	-	3
		California Intercontinental Univ.	2	2	2	2
		Learnet Academy	93	-	-	31
11.9999	Computer and Information Sciences and Support Services, Other	Brand College	1	-	1	1
		Mt Sierra College	9	4	2	5
		Pitzer College	-	-	1	0
15.1202	Computer Technology/ Computer Systems Technology	Advanced Computing Institute	67	74	92	78
		Learnet Academy	-	13	11	8
		Supply Total/Average	**1,673**	**1,241**	**1,308**	**1,407**

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Computer Systems Analysts (15-1211)	12,374	12,814	439	4%	893	$38.23	$49.32	$62.23
Database Administrators and Architects (15-1245)	3,029	3,138	109	4%	217	$33.58	$45.11	$60.77
Computer Occupations, All Other (15-1299)	17,255	17,376	121	1%	1,225	$27.21	$38.34	$53.77
Data Scientists and Mathematical Science Occupations, All Other (15-2098)	696	781	85	12%	74	$36.01	$49.34	$71.11
Total	**33,355**	**34,108**	**753**	**2%**	**2,409**			

Exhibit 5. Orange County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Computer Systems Analysts (15-1211)	5,650	5,906	256	5%	416	$37.16	$47.91	$60.45
Database Administrators and Architects (15-1245)	1,241	1,286	45	4%	88	$32.32	$43.42	$58.51
Computer Occupations, All Other (15-1299)	7,359	7,468	109	1%	534	$26.40	$37.17	$52.12
Data Scientists and Mathematical Science Occupations, All Other (15-2098)	311	353	42	13%	34	$34.61	$47.27	$67.85
Total	**14,561**	**15,014**	**452**	**3%**	**1,072**			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Computer Systems Analysts (15-1211)	18,024	18,719	695	4%	1,309	Bachelor's degree
Database Administrators and Architects (15-1245)	4,270	4,424	154	4%	305	Bachelor's degree
Computer Occupations, All Other (15-1299)	24,614	24,844	230	1%	1,758	Bachelor's degree
Data Scientists and Mathematical Science Occupations, All Other (15-2098)	1,007	1,134	126	13%	108	Bachelor's degree
Total	**47,916**	**49,122**	**1,205**	**3%**	**3,481**	

Appendix B: Sources

- O*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

For more information, please contact:

Luke Meyer, Director
Los Angeles/Orange County Center of Excellence
lmeyer7@mtsac.edu

April 2021