Current and Future Role of Data Science in the North Carolina Economy

Research Project

THE NATIONAL CONSORTIUM for DATA SCIENCE

Science, Technology and Innovation
COMMERCE

Data Science and the North Carolina Economy

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How important is Data Science to NC's economy today, and how important could it be in the future?

Project underway to survey NC data science leaders on identification of the most valuable strategies:

- Survey/research of major data science assets in the state
- Qualitative survey of 30+ data science leaders from industry, academia, and government
- Broader-based online survey of employer skill needs and the NC data "ecosystem" coming soon
- Engagement with KFBS "STAR" Program student team: Develop methodology to assess the state's relative standing nationally
- Conscious effort to be geographically and otherwise diverse
- Report to be issued Summer of 2016

Benchmark Findings

Tech Jobs Good for NC – $$$$

Title	Employment	Annual Average Wage
Computer and Information Systems Managers	11,970	$130,440
Software Developers, Systems Software	10,540	$104,950
Computer and Information Research Scientists	300	$103,270
Computer Network Architects	3,980	$101,150
Statisticians	950	$96,840
Software Developers, Applications	21,190	$94,130
Computer Systems Analysts	16,680	$87,220
Computer Occupations, All Other	3,550	$84,480
Database Administrators	2,640	$83,960
Computer Programmers	7,370	$80,320
Business Operations Specialists	29,730	$69,460
Market Research Analysts/Marketing Specialists	12,910	$69,340
Operations Research Analysts	1,750	$68,810
Web Developers	2,860	$64,370
Detectives and Criminal Investigators	3,340	$54,610
North Carolina - All Occupations	4,030,880	$43,280

Source: Labor and Economic Analysis Division, NC Department of Commerce.

Tech Jobs Important to NC's Future

Description	2015 Jobs	2010-15 % Change	Current Earnings
Software Publishers	12,565	68.41%	$136,238
Computer Systems Design Services	21,627	60.38%	$93,068
Custom Computer Programming Services	21,369	48.51%	$105,088
Data Processing, Hosting, and Related Services	12,152	29.30%	$114,154
All NC Occupations	4,030,880	3.33%	$43,280
Other Computer Related Services	2,792	-11.05%	$103,730
Computer Facilities Management Services	686	-40.81%	$79,609

Source: EMSI Q3 2015 Data Set as per NC Labor and Economic Analysis Division.

We Can Play With the Big Boys (In Certain Industry Segments)

Business Segment	BOS	CHI	DCA	DFW	NYC	PHL	RDU	LAX	SAN	SFO	SEA
Bioinformatics/genomics	2.3	0.1	1.4	0.7	0.8	0.3	**2.5**	0.9	2.6	1.3	1.2
Web analytics	0.6	1.3	0.5	0.6	0.8	0.8	**1.7**	1.5	1.1	0.6	1.1
Sentiment/social media	1.2	0.9	0.8	0.8	1.3	0.4	**1.6**	1.2	0.7	1.5	0.8
Selected applications	0.9	1.0	1.2	0.7	1.1	0.7	**1.4**	1.3	1.2	0.9	0.8
Semantic analysis	1.2	0.5	1.3	0.8	1.4	0.9	**1.3**	1.2	0.5	1.4	1.0
Geo-spatial analysis	0.8	0.3	1.2	0.5	0.7	0.5	**1.3**	0.4	0.7	0.6	0.9
Data Integration	1.4	1.1	1.2	1	0.8	1.2	**1.2**	1.1	1	0.8	0.4
Automated trading	-	5.9	0.2	0.5	3.4	1.0	**1.2**	0.8	-	0.4	0.9
Ad targeting / serving	0.8	1.1	0.2	0.5	3.1	-	**1.2**	3.5	0.3	1.6	0.2
BI and business analytics	0.6	1.1	1.0	1.5	0.9	1.3	**1.1**	1.0	0.9	0.7	1.2
Big Data	1.9	0.7	1.1	0.7	1.1	0.7	**1.0**	0.7	0.8	2.0	1.6
Hadoop	1.0	0.6	0.6	0.9	0.8	0.6	**1.0**	1.4	0.9	1.9	1.5
Fraud, threat & risk detection	0.7	0.8	1.3	1.0	0.9	1.2	**1.0**	1.1	1.4	0.6	0.6
Data analysis/visualization	0.8	1.0	1.0	1.1	1.0	1.1	**0.9**	0.9	1.0	0.9	1.0
Data Management	1.3	0.9	0.7	1	0.8	1	**0.8**	1.2	0.6	1.4	1
NoSQL/SQL	1.6	0.9	0.5	0.4	0.9	1.1	**0.8**	0.9	0.5	1.6	0.9
Data Warehouse	1.2	1.2	0.8	1.6	0.8	1.0	**0.8**	1.2	0.4	1.1	0.8
Data mining and analysis	0.7	0.9	1.0	0.8	1.0	1.0	**0.8**	0.8	1.0	0.8	0.9
Image analysis	1.0	0.6	0.6	0.5	0.8	0.7	**0.8**	1.3	1.4	1.0	0.4
DS/ML/Pred An	1.5	1.2	0.7	0.7	1.3	0.8	**0.6**	1.0	1.6	1.5	0.8
Data visualization	1.5	0.9	1.3	0.3	1.0	1.0	**0.6**	0.8	1.5	1.0	1.1
Network analytics	1.3	0.9	0.9	0.9	0.8	0.2	**0.6**	0.7	0.7	0.8	0.4
Cybersecurity	0.4	0.3	5.0	0.2	0.3	0.2	**0.4**	0.9	2.5	0.4	0.4

Source: 2013 analysis of LinkedIn data (Nexus Associates) as per The MA Big Data Report, 2013.

Top Hiring Big Data Companies: Broad Array of Industries

IBM	Lenovo
ACCENTURE	MetLife
Bank of America	Novant Health
BB&T Corporation	Oracle
Blue Cross and Blue Shield	Pharmaceutical Product Development,
Carolina Healthcare System	PricewaterhouseCoopers
Cisco	Quintiles
Citrix	Red Hat
Cree	RTI International
DataMasters	SAS Institute
Deloitte	TEKsystems
Deutsche Bank	Time Warner
Fidelity Investments	United Technologies
General Dynamics	Wells Fargo

Sources: The Conference Board Help Wanted Online (HWOL), February 2016, by Labor and Economic Analysis Division, Nov. 2015 - Feb. 2016.

Interview Findings

Qualitative interviews with 30 Stakeholders

5 Themes Emerged from Interviews

1. Data science assets are here but NC needs to spread the word
2. Workforce readiness key for statewide opportunities
3. Startup incubators and access to venture capital limited in NC
4. Collaboration across public and private sector is necessary to spur industry growth
5. Government has a role

1) Data science assets are here but NC needs to spread the word

- Stakeholders spoke positively of universities and companies in North Carolina like SAS, IBM, Red Hat, Inmar, etc.
- Interviewees felt the need for an inventory of data science assets that could be used in communications
- Quality of life measures are assets that are well known
- Some concern exists about disparities between regions

2) Workforce readiness key for statewide opportunities

- Data science relevant for all industries
- Shortage of qualified data science personnel
- Field changing so quickly, keeping up with new tools is a challenge
- A robust pipeline of data science talent in a region is required to maintain sustainable growth in the industry.
- Efforts at university underway but inadequate
- Biggest need in K-12 STEM

3) Startup incubators and access to venture capital limited in NC

- Start up activity under represented in NC
- Research okay but opportunities exist in translation
- Venture funding shortage
- NC can not compete with Silicon Valley or Boston but in key sectors enabled by data science NC could lead
- An innovation culture/community needs to be fostered
- Many of the interviewees had worked with startups

4) Collaboration across public and private sectors is necessary to spur industry growth

- Data Science community growing in Triangle needs work elsewhere
- No organization stepping up to lead effort
- More collaboration on research and workforce needed
- The existence of a data science community within a region (big companies, start ups, discussion forums) will attract and retain talent.

5) Government has a role

- Government can convene stakeholders
- Define terms, set goals, track progress
- Lead by example (i.e., Open Raleigh, GDAC)
- Support of universities with a focus on data science research is necessary to establish the industry's infrastructure in a region.

SWOT Analysis for Data Science in NC

Strengths

- University system
- Iconic industry leaders present in the state like (SAS, IBM, Red Hat, Quintiles)
- Wake Tech' analytics program
- NC Open Data/Government Data Analytics Center/NC Innovation Center
- Domain expertise in biosciences, finance, and manufacturing

Opportunities

- Community College system
- Existing clusters
- Translate university research
- Lead nation in developing policy framework
- Marquee data research center

Weaknesses

- Startup culture
- Venture capital funding
- Tech community limited
- Branding
- K-12 STEM
- No convener

Threats

- Technology disparity between regions
- Privacy/Security backlash
- Lure of small companies to SV & Boston for funding/management expertise
- Big investments in Big Data from other states

Source:

Questions