Harnessing Data Science for Economic Development in North Carolina

Final Presentation

29th April 2016
Project Team

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- Previous – GLC Consulting, Citigroup

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- Previous- Consulting

Prerana Manvi
- 1st year MBA
- Previous- Sustainability Consulting

Wen Lin
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- Previous- Healthcare, Marketing

William Stelpflug
- Senior, Economics
- Previous – Investment Research

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Key project stakeholders

David Knowles
Executive Director of Economic Development, RENCI

Scott Doron
Associate Director, OSTI NC Department of Commerce

Shannon McKeen
Adjunct Faculty of Business Development, Kenan-Flagler Business Development
The project focused on answering the key question below:

What best practices should NC adopt, to leverage its data science capabilities to enhance economic activity?

Context:

Board of Science Technology & Innovation identified Data Science as a technology “Grand Opportunities” for North Carolina.

Despite having data science related assets, NC is not recognized as a global leader.
North Carolina should expand its data science ecosystem by focusing on 3 major recommendations:

- **Leverage**: Companies/Start-ups
- **Generate**: Pipeline of talent
- **Facilitate**: Collaboration

**Ecosystem**

**Culture & Lifestyle**
The project identified best practices across benchmark regions.

Background | Leverage | Generate | Facilitate | Analysis
The data science ecosystem consists of 4 major players and the relationships between them.
Recommendation #1: A robust data science environment requires a mix of large companies and start-ups. North Carolina should leverage the presence of large companies and incentivize the growth of start-ups within the state.
North Carolina should leverage major companies and start-ups by adopting the sub recommendations below:

- **Increase access to Venture Capital**
- **Develop potential entrepreneurs**
- **Utilize anchor companies and industries**

**Case Study:**
- Bay Area
- Austin
- Seattle
North Carolina should leverage major companies and start-ups by adopting the sub recommendations below:

**Increase access to Venture Capital**

- Develop potential entrepreneurs
- Utilize anchor companies and industries

**Case Study**
- Bay Area
- Austin
- Seattle

Background | Leverage | Generate | Facilitate | Analysis
North Carolina has less venture capital investment than other regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Venture Capital Spending Rank (within US)</th>
<th>Venture Capital Invested in 2014 ($ Millions)*</th>
<th>Population in the state (Millions)*</th>
<th>GDP in the state ($ Millions)*</th>
<th>% Venture Capital/GDP</th>
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<tbody>
<tr>
<td>California</td>
<td>1</td>
<td>28,100</td>
<td>39.1</td>
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<td>16</td>
<td>340</td>
<td>10.0</td>
<td>503,700</td>
<td>0.07</td>
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</tbody>
</table>

*Figures rounded to nearest 100s

Source: UNC Research, Wikipedia

CA receives 57% of overall VC investments
The biggest advantage of the Bay Area is the high amount of venture funding invested in the area.

“There is obviously the talent pool - the talent is here because of the risk-seeking venture community, and because of the weather & lifestyle”

- Ben Gimpert, UC Berkeley School of Information
North Carolina should attract new investors

RTP has a high concentration of start-ups

Start-ups find low levels of local funding

Start-ups look for funding opportunities outside the state

RECOMMENDATIONS

Build a marketing case to attract outside investors

Organize events to connect VCs with students and start-ups

Designate data science ambassadors to promote NC in other states
North Carolina should leverage major companies and start-ups by adopting the sub recommendations below:

- Increase access to Venture Capital
- Develop potential entrepreneurs
- Utilize anchor companies and industries

Case Study:
- Bay Area
- Austin
- Seattle
Austin adopted initiatives to empower entrepreneurs with knowledge and resources.

First of its kind private-public investment

$775,000 Total Budget
- $480K ATC members
- $295K City of Austin

Austin Technology Partnership

Austin’s Startup Culture

Small Business Development

Austin Office of Economic Development
- Business plan development
- Funding
- Mentorship
- Collaboration

Background | Leverage | Generate | Facilitate | Analysis
North Carolina should leverage major companies and start-ups by adopting the sub recommendations below:

- Increase access to Venture Capital
- Develop potential entrepreneurs
- Utilize anchor companies and industries

Case Study:
- Bay Area
- Austin
- Seattle
Seattle leveraged the presence of anchor companies and created business-friendly neighborhoods

"Only in Seattle"

| Facilitate business development by assessing commercial affordability | Create Business Improvement Areas within cities/towns | Fund greening and beautification of neighborhood business districts | Marketing and promotion (events, social media, district advertising) |

Background | Leverage | Generate | Facilitate | Analysis
North Carolina should attract new resources and leverage current ones to develop its major companies and start-ups

- Develop a business case
- Host events
- Appoint ambassadors
- Provide start-up resources
- Build business communities
Recommendation #2: Academic institutions play a key role in data science. **North Carolina** should **generate a pipeline of data science talent** through its universities.
North Carolina should take specific actions to generate a pipeline of talent

- Expand community college and high schools programs
- Provide internships and scholarships
- Develop new professional programs

Case Study: Austin
Case Study: Massachusetts
Case Study: Massachusetts Bay Area
North Carolina should take specific actions to generate a pipeline of talent

- Expand community college and high schools programs
- Provide internships and scholarships
- Develop new professional programs

Case Study:
- Austin
- Massachusetts
- Massachusetts Bay Area

Background | Leverage | Generate | Facilitate | Analysis
Austin partnered with local institutions to expand its data science pipeline and improve talent retention

High Schools
- Tech certifications
  - Workforce training
- Programs to offer college credit to high schoolers

Community Colleges
- Associate degrees
- Advanced Programmer Training
- Transfer degrees

Universities
- Partnerships to split time with community colleges
  - PACE
  - Pathways
  - DTC70

Austin, TX
North Carolina should take specific actions to generate a pipeline of talent

- Expand community college and high schools programs
- Develop new professional programs
- Provide internships and scholarships

Case Study: Austin
Case Study: Massachusetts
Case Study: Massachusetts Bay Area

Background | Leverage | Generate | Facilitate | Analysis
Massachusetts sponsored data science internships through the Massachusetts Technology Collaborative

Government provides funds

Tech companies (<100 employees) apply to hire

MA students apply for internships

Non-profit matches interns with companies

MASSTech provides stipends

Interns more likely to work in MA

Leading to talent development/retention

89% of companies would recommend sponsoring an internship through the MTIP

92% of interns rated their internship as successful in providing them with valuable skillsets.

Source: MassTech.org
North Carolina should take specific actions to generate a pipeline of talent

- Expand community college and high schools programs
- Provide internships and scholarships
- Develop new professional programs

Case Study:
- Austin
- Massachusetts
- Massachusetts Bay Area
Massachusetts promoted data science in the UMass system through program creation and federal/industry funding

**Actions**

- Pushed creation of Center for Data Science at UMass Amherst
- Promoted Concentration in Data Science in Amherst’s Computer Science program
- Assists institutions in securing federal and industry funding

**Results**

- System research partnerships include Google, Oracle, MassMutual, Raytheon
- System awarded 17% of state data science degrees in 2012
- Majority of these graduates will remain in Massachusetts

**Sources of Data Science-Related Funding to UMass Since 2010**

- Federal
- Industry
- University
- NGO
- Hospitals
- State


**Background | Leverage | Generate | Facilitate | Analysis**
The Bay Area benefited from immersive data science programs

Four year degrees in universities are too long to meet the growing demand for data scientists.

Programs at state universities, community colleges, and educational companies help meet demand.
The UC system created programs to drive economic development in local communities

- UC institutions support incubators and accelerators
- The universities partner with the private sector

<table>
<thead>
<tr>
<th>Community Focus</th>
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</thead>
<tbody>
<tr>
<td>Accelerators and incubators are focused on economic development</td>
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<tr>
<td>Campuses in areas without strong business communities pursue more partnerships</td>
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</table>

UC institutions support incubators and accelerators
The universities partner with the private sector

Community Focus

Accelerators and incubators are focused on economic development
Campuses in areas without strong business communities pursue more partnerships
North Carolina should graduate and retain a broad range of professionals within the state in order to generate a strong talent pipeline.

- Expand community college and high schools programs
- Provide internships and scholarships
- Provide new professional programs

- Promote education partnerships
- Support in-state internships in data science
- Develop data science degree programs
Recommendation #3: Collaboration is key to a sustainable infrastructure for data science. North Carolina should facilitate collaboration among various data science entities.
North Carolina should adopt initiatives to enable collaboration across start-ups, companies, academic institutions and the government.

- **Facilitate Collaboration**
  - Create a consortium to integrate state-wide efforts
  - Define an open data policy
  - Host data-driven competitions

**Case Study:**
- Massachusetts
- Bay Area
- Seattle

Background | Leverage | Generate | Facilitate | Analysis
North Carolina should adopt initiatives to enable collaboration across start-ups, companies, academic institutions and the government.

**Facilitate Collaboration**

- **Create a consortium to integrate state-wide efforts**
  - Case Study: Massachusetts

- **Define an open data policy**
  - Case Study: Bay Area

- **Host data-driven competitions**
  - Case Study: Seattle
Massachusetts Technology Collaborative enabled state-wide collaboration across four key stakeholders

- **Government**
  - Provides operational funding
  - Receives advice on industry cluster and economic development

- **Private sector**
  - Provides revenues from programs
  - Receives workforce training in data science, including for management

- **Universities**
  - Receives matching grants for collaborative research
  - Hosts data science events for students

- **Non-profits**
  - Funds hack/reduce, a non-profit community data science forum

Background | Leverage | Generate | Facilitate | Analysis
North Carolina should adopt initiatives to enable collaboration across start-ups, companies, academic institutions and the government:

- Create a consortium to integrate state-wide efforts (Case Study: Massachusetts)
- Define an open data policy (Case Study: Bay Area)
- Host data-driven competitions (Case Study: Seattle)
The Bay Area integrated open data initiatives into the local government

California Open Data Hierarchy
(San Francisco/San Jose)

City Level
Civic Innovation/CIO

Departmental
Public Safety
IT

Initiatives
Homelessness
Emergencies
Data Integration

“San Francisco is home to the world’s greatest entrepreneurs, the ones who have ‘disrupted’ numerous industries, and we are bringing those same disruptive technologies to improve delivery of City services for our residents.”

- San Francisco Mayor Edwin Lee
North Carolina should adopt initiatives to enable collaboration across start-ups, companies, academic institutions and the government.

- Create a consortium to integrate state-wide efforts
  - Case Study: Massachusetts
- Define an open data policy
  - Case Study: Bay Area
- Host data-driven competitions
  - Case Study: Seattle
Seattle used a data science hackathon to tackle civic issues

• City of Seattle and Commute Seattle
• Coders, data analysts, entrepreneurs

Govt. and NGOs

• City
• Amazon, Socrata etc.

Companies

Funding and Data

Leadership and Initiative

Participants and Hosts

Speakers and Support

Startups and people

Universities

Background | Leverage | Generate | Facilitate | Analysis
North Carolina should incentivize the open data usage and create a networking organization to facilitate collaboration

- Create a consortium to integrate statewide efforts
- Define an open data policy
- Host data-driven competitions

- Create data science consortium
- Designate officer for open data initiatives
- Sponsor hackathons
Analyzing Recommendations: The following analysis prioritizes recommendations based on criteria of:
- Impact
- Investment
- Implementation
High priority recommendations focus on leveraging resources that currently exist within North Carolina.

- **Open data initiatives**
- **State-wide Consortium**
- **Sponsored events**
- **Education partnerships**
- **Scholarships**
- **Start-up resources**
- **New degree programs**
- **Venture Capital**
- **Anchor Companies**

**Legend**
- **Leverage companies and start-ups**
- **Generate talent pipeline**
- **Facilitate collaboration**
- **Size of Bubble = Impact**

**Difficulty of Implementation**
- Low
- High

**Capital Investment**
- Low
- High
North Carolina should take phased steps in order to develop its data science ecosystem

**Immediate**
- Use anchor companies
- Sponsor events
- Execute open-data initiatives
- Provide start-up resources

**Short Term**
- Develop education partnerships
- Fund data science scholarships

**Long Term**
- Create data science degree programs
- Attract Venture Capital
- Establish state-wide consortium
Carrying forward the momentum, and “closing the deal” is essential to establish NC as a data science hub.

Phase 1

Phase 2

Phase 3

MA
SFO
Austin
Seattle

External best practices
Internal Feasibility

Implement
Market

Data Science Hub
Appendices
Suggested Links: Massachusetts

Reports:

Organizations:
Massachusetts Technology Collaborative: http://www.masstech.org/
Massachusetts Technology Leadership Council: http://www.masstlc.org/
Massachusetts Big Data Initiative: http://www.massbigdata.org/initiative/
Green High-Performance Computing Center: http://www.mghpcc.org/
UMass Amherst Center for Data Science: https://ds.cs.umass.edu/
Metropolitan Area Planning Council: http://www.mapc.org/
hack/reduce: http://www.hackreduce.org/
Suggested Links: Massachusetts

**Start-up Resources**
ATP-
http://www.austintexas.gov/edims/document.cfm?id=246420
http://www.austintexas.gov/edims/document.cfm?id=227255

**Small Business Development**
http://www.austintexas.gov/department/small-business-program
http://www.austintexas.gov/department/small-and-minority-business
http://www.austinchamber.com/membership/small-business-development/

**Education**
DTC70-
http://www.austinchamber.com/education-talent/education-initiatives/DTC70.php

**Community Colleges**
http://cis.austincc.edu/accelerated-programmer-training
https://sites.google.com/a/austincc.edu/apt-program/home
https://admissions.utexas.edu/enroll/pace
Suggested Links: Seattle

Seattle.gov
http://bottomline.seattle.gov/2016/03/31/mayor-ed-murray-announces-1-6-million-for-neighborhood-business-districts/
http://www.seattle.gov/economicdevelopment/
http://www.seattle.gov/economicdevelopment/business-owners

Related Articles
Suggested Links: Bay Area

Related Articles
http://www.bloomberg.org/about/
http://research.ucmerced.edu/
http://www.bayareaeconomy.org/publications-list/
http://www.meetup.com/SF-Data-Science/
A combination of primary and secondary research drove research and findings.

### Primary Research

**Expert interviews**
- Expertise that can drive further iterations of hypotheses
- Depth of understanding beyond basic case studies

**Surveys and focus groups**
- Major data to reveal target areas
- Responses representative of data science industry
- Focus group of students in data science programs

### Secondary Research

**Third party data**
- Analysis of how data science has affected the economy
- State reports on data science usage

**Data science reports**
- Specific information for niche industry area
We took a step-by-step approach to create hypotheses and validate recommendations.

1. Establish **hypotheses** regarding data science and economic development.
2. **Group** hypotheses into bins based on common **themes**.
3. **Create a framework** for analyzing comparable regions.
Rating/Ranking Mechanism that we used to funnel into the final 3 recommendations

- **15** Recommendations based on bins
- **6** Consolidated recommendations by theme
- **3** Most appropriate recommendations based on region selections
Increase access to venture capital - North Carolina has less venture capital investment than other regions

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### Venture Capital Investments 1985-2014 By State ($ Millions)

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<tbody>
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<td>California</td>
<td>16,710.6</td>
<td>9,606.3</td>
<td>8,664.1</td>
<td>10,145.6</td>
<td>10,883.1</td>
<td>12,953.5</td>
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<td>14,906.4</td>
<td>10,299.0</td>
<td>11,924.8</td>
<td>15,291.9</td>
<td>14,505.3</td>
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<td>2,811.3</td>
<td>3,171.6</td>
<td>2,737.0</td>
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<td>843.1</td>
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<td>Utah</td>
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<td>638.8</td>
<td>473.4</td>
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<td>Maryland</td>
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<td>325.9</td>
<td>709.5</td>
<td>668.3</td>
<td>843.2</td>
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<tr>
<td>Minnesota</td>
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<td>388.7</td>
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<td>310.7</td>
<td>432.1</td>
<td>460.0</td>
<td>306.9</td>
<td>195.1</td>
<td>299.7</td>
<td>259.9</td>
<td>269.9</td>
<td>356.9</td>
</tr>
</tbody>
</table>

**North Carolina**

| 585.6 | 551.2 | 379.4 | 311.1 | 346.9 | 422.5 | 555.4 | 519.0 | 254.9 | 422.1 | 304.0 | 181.2 | 259.6 | 341.5 |

CA is 57% of overall VC investments
Why is there No VC funding in NC or SE? – Appendix

Slide

#1 – Starts with Limited Partners (LPs) → Lack of big exits

- Over last decade, **few billion dollar VC** exits in NC, SC, Georgia, Florida, Alabama, Mississippi? LPs play the odds – go where the returns are.

#2 – Very conservative cultural climate – but getting better; more risk takers

#3 – Need better management teams. Need sales people and marketing people. And true CEO leaders.

#4 – Need more corporate partners and big customers → who will buy our new stuff?
Both San Francisco and San Jose are supported by Bloomberg Philanthropies through the ‘What Works’ city initiative

**“What Works” City Initiative**

| A national initiative started by Michael Bloomberg to help American cities enhance the use of data for their urban goals | San Francisco and San Jose joined the initiative in December 2015 (**Charlotte, NC and Raleigh, NC joined in March 2016**) |

**Application of Initiative**

| **San Francisco** - shifting contracting practices to focus on structuring and managing contracts, to bring accountability on how public funds are spent | **San Jose** - establishing and improving open data practices to make city data more accessible to city managers and the public |

- [http://www.bloomberg.org/about/](http://www.bloomberg.org/about/)
Anchor Companies – With organic talent pool growth, and magnetism effect, South Lake Union transformed Seattle

The transformation of South Lake Union district stands as a metaphor for this city’s emergence as West Coast’s second most important hub of technology and entrepreneurship

“It's like Detroit used to be for car companies, the galactic players are here, and they are creating lots of little companies”

- Bill Hilf, VP of Cloud Product Management, HP
Seattle’s base in technological entrepreneurship

Origins of Technological Entrepreneurship in Seattle

Craig McCaw’s mobile empire

Microsoft

U Wash’s Science and Engg. programs
A lesser known reason may be Seattle’s infrastructure. Housed in the Westin Building in downtown Seattle, the Seattle Internet Exchange (SIX) has grown to the 2nd largest Internet exchange point in the US. SIX is a neutral, independent peering point for cloud companies to route data over the Internet. It provides line-rate, non-blocking connectivity up to 100Gbps, giving cloud companies low latency and high performance when accessing cloud providers like Amazon and Microsoft, and content companies like Netflix and Akamai.

- **EdRepublic** – a Seattle-based startup using the Internet to reduce the time it takes to evaluate a developer’s coding skills by building an online service that evaluates a developer’s code. They came to the EDC for help in navigating the investor landscape in Seattle and Silicon Valley.
- **Globatom** – a Seattle-based startup using the Internet to reduce import/export time to market for small to medium-sized businesses by moving freight packing and shipping orderable on the Web. They came to the EDC for an introduction to the Port of Seattle and supplier network.
- **Xero** – a Bay Area company who has developed an online accounting package for small businesses. The EDC partnered with [StartupSeattle](#) to provide them with information about the local Seattle commercial real estate market and workforce trends.
What

• Mayor Ed Murray signed an Executive Order directing all City departments to comply with a new open data policy

How

• Collaboration between the City of Seattle, the University of Washington, and the Sunlight Foundation through Bloomberg Philanthropies' national What Works Cities initiative.

Impact

• Since launch, more than 400 datasets have been made open. The program has set a goal of having 544 datasets available to the public by the end of 2016.

"Seattle is one of the most innovative and creative cities in the country; by opening up key City datasets to the public, we make it possible for problem solvers outside of government to get involved in finding solutions to civic challenges."

- Mayor Murray
Seattle’s collaborative effort to “Hack The Commute” – Appendix Slide

• The city compiled what Faber called “a huge data set” using Socrata, which contains more than 100 data sets, APIs and additional resources that developers can access before, during and after the event.

• The city also created a community on Reddit where developers can plan and organize.

• Hackcessible, a team of University of Washington students, made a web app that helps people with disabilities find the best route by mapping which bus stops have curb ramps and hills.
The Austin Technology Partnership (ATP), is a unique partnership formed between the City of Austin and the Austin Technology Council (ATC). The ATP positions Austin as the first market in the country to establish a public-private investment to study and strengthen tech as a key economic engine impacting the broader community. The ATP brings together City leadership, regional stakeholders, and the technology industry to advance the regional tech economy and ensure all Austinites can access the benefits it delivers. With a $21.5B annual regional impact and connection to 26 percent of regional jobs the technology industry brings to the city, the stakes have never been higher.

The ATP is a new model for public-private collaboration, developing an accurate understanding of Austin’s needs and efficiently applying economic dollars and efforts in support of initiatives to sustain a thriving regional innovation economy. The ATP will support stakeholder efforts to develop and execute efficient economic policies along four priorities.

Talent. Connect tech job creators to educators and workers.
Capital. Increase access to later stage capital to support the region’s high-growth companies.
Life Sciences. Support the build-out of a strong life sciences ecosystem.
Market Development. Conduct research and stakeholder education to foster shared perspective and sustained market growth.
“Industry and City leaders spent the better part of two years developing a strategic set of shared priorities,” said ATC President and CEO Julie Huls. “Austin is the only tech market in the U.S. to galvanize industry support to partner with a municipality to grow a stronger regional economy. We’re certain this new path will lead us to more efficient and more effective investment of regional resources to support our innovation-based economy. This partnership will allow ATC to serve our members and our market at a level unparalleled in the U.S.”

Julie Samuels, Executive Director of San Francisco-based Engine Advocacy, agrees. “Engine works around the country to forge stronger ties between innovators and policymakers. The partnership between ATC and the City of Austin is a new model that places Austin at the forefront of a global discussion.”

At the core of the ATP is essential, and overdue, data collection, analysis, and reporting to establish a shared understanding of the economic landscape impacting the four priorities. The data will serve to sync the tech community to regional talent and capital resources and support all regional stakeholder efforts to strengthen the innovation economy.

The ATP represents a total annual public-private investment of $775,000, broken down to a private sector contribution of 62 percent and a public sector contribution of 38 percent. The City’s investment in the ATP represents less than .01 percent of the City’s 2015 Annual Budget invested in support of 26 percent of Central Texas jobs.

Over the next 12 months, ATP data collection and subsequent education and reporting requirements will serve as a resource to City leadership, regional stakeholders, and others seeking to strengthen the Central Texas innovation economy.
Our actionable recommendations were tested across all regions – Companies and Start-ups

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<tr>
<th>Recommendations</th>
<th>Austin (TX)</th>
<th>Massachusetts (MA)</th>
<th>San Francisco (CA)</th>
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<td>Potential Entrepreneurs</td>
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<td>Fund internships /scholarships</td>
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<td>New degrees/research</td>
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Regional summary of findings from secondary research indicate greater emphasis on companies and governments

Massachusetts
- Large investment through federal grants
- Data Science is diversified across industries
- Producing data science graduates, unable to retain

Texas
- Industry emphasis on Data Science
- Low state and local tax burdens

Bay Area
- Innovative culture that attracts business activity
- Low government involvement

Seattle, WA
- Large number of Data Centers and cloud infrastructures
- University of Washington involved with businesses
Site Selection Consultants Stress Primacy of Talent Pipeline

“Every region talks about having strong computer science, technology-type industries. You need the labor market to differentiate”

—Steve Weitzner, Silverlode Consulting

A talent pipeline is the most important factor in site selection

- Training and experience of the existing workforce
- In-migration rates of trained individuals in young age groups

Incentives are a secondary factor in site selection

- Tax exemptions, job creation grants can help, but may require a large scale
- Louisiana: 10 year 30% payroll tax discount for certain new software jobs

Data science requires a full “industry cluster”

- Presence of industries with major data science needs
- With supporting lawyers, bankers, accountants, infrastructure
- Only Triangle area has this in NC

Quality of universities a major factor, and strongest point for North Carolina

- UNC, Duke, NC State’s programs complement each other well
- UNC-Charlotte’s Informatics program is gaining recognition
Academia are of the opinion that private sector plays a major role in attracting and placing students in data science related roles.

Collaboration across public and private sectors is essential.

Talent is the most important factor in building data science.

Developing a progressive business friendly brand for the state.

An entire, conducive ecosystem has to exist, in which data science can thrive and grow.
Entrepreneurs and professionals in the field of Data Science reinforce the importance of a talent pipeline

It is best to explore industries that have great “magnetism” for data science

- Bay Area has great exposure to data science as it has a wide range of industries that use and apply data science models in their business

Talent is the most important factor in building data science

- Quality of life, and cost of living attract professionals
- Mindsets also important – the ideal data scientist incorporates his intuition and experience into his analyses

Pipeline is key; presence of universities which offer data science courses is essential

- The ideal data scientist is a mix of an engineer and an art/humanities student

Newer money is key to fuel start ups and innovation

- Bay Area has a lot of newer money which is fluid

Students are incentivized to take up data science, if it is included under STEM
Data Science in the Bay Area is highly correlated with the tech industry;

Companies like Google, Apple and Facebook hold direct responsibility for the “Big Data” boom