

THE SOUTH
CAROLINA
INFORMATION
TECHNOLOGY
WORKFORCE 2017
CHALLENGES &
OPPORTUNITIES

RESEARCH
METHODOLOGY

Appendix A

RESEARCH METHODOLOGY

To better understand the gaps between information technology talent supply and demand, a hybrid research approach was used that included primary quantitative and qualitative research and analysis of third-party publicly available information. Third party data sources included existing workforce studies, publicly available databases of job listings such as Glassdoor, Indeed, ZipRecruiter, CareerBuilder, Monster, Cyberseek, and the SC Works site.

The hybrid approach not only provided valuable insight regarding the state's IT workforce, it also allowed the research team to make recommendations that could have meaningful impact in both the near and long term. A summary of the research scope is provided below.

- IT employer needs
- Projected IT future employment trends/growth
- Workforce development programs, initiatives, and entities
- Gap analysis
- Recommendations for action

The research team executed the following timeline for the work scope included herein.

Phase I Discovery: March 2017-May 2017

During Phase I, the research team conducted a qualitative inquiry of key stakeholders that included university, corporate, entrepreneurial, state, and municipal organizations. The process included an exploration of the assets, aspirations, and market realities that exist for South Carolina. Specifically, the team conducted over 40 in-depth stakeholder interviews in South Carolina and separately received 117 survey responses from 500 surveys that were distributed statewide. The 117 responses represent an appropriately random, statistically significant indicator of the demand for information technology talent and specific concerns regarding the attraction and retention of the same.

The goal of the interview and survey questions was multi-faceted. First, the research team wanted to gather data and information about the organizations' current information technology talent needs and challenges. Second, the team wanted to gain a better understanding of future demands or forecasts related to talent, technologies, challenges, and opportunities. Third, the research team wanted to learn about any programs, or efforts, that were currently in place to address IT talent needs and their relative success. To understand the meaning behind the numbers and identify specific themes, 40 face-to-face or telephone interviews were conducted with employers, economic development entities, institutions of higher education, and other non-governmental stakeholders. These interviews were conducted in every major population center in South Carolina. Qualitative inquiry with open-ended questions augments third-party information and survey results with insights that cannot be easily obtained any other way.

In addition, the research team collected benchmarks focused on over 20 different university and regional innovation ecosystems and the wide variety of publicly available information sources mentioned previously. During this process, the research team inquired with various stakeholders at the different university and regional innovation ecosystems throughout the country.

The overall research approach allowed the research team to

- Gather data and information that was not biased by assumptions and provided the ability to make informed, objective recommendations;
- Identify benchmarks and best practices that could be leveraged in South Carolina; and
- Discover value added and innovative trends that could be adopted in South Carolina.

Taken together, the data and insights from all sources gave a strong indicator of the information technology talent needs across the state.

Phase II Assessment: June 2017:

During Phase II, the research team analyzed results and identified key findings from Phase I outlined in the summary report. This process allowed for constructive feedback and elicited new questions that needed to be addressed more fully in the report to ensure that the identified gaps were fully understood and specific recommendations could be identified to address those gaps.

Phase III Recommendations: August 2017:

During Phase III, the research team compiled the summary report with recommended strategies to close the information technology talent gaps and to build a robust knowledge-based economy that drives information technology talent development, attraction, and retention. The resulting recommendations include suggested policy changes, employer incentives, programs, events, and mentoring activities designed to vigorously address the identified gaps.

The compiled report and recommendations were submitted to IT-oLogy for use by South Carolina in order to foster an information technology talent development, attraction, and retention program that can help drive a knowledge-based economy. Key stakeholders from across the state can engage at various levels and support the overall effort.

The analyst, Loretta P. Dodgen, Ed. D., presented the findings and recommendations at the IT-oLogy Summit on Information Technology on October 10, 2017.

RESEARCH TEAM

Multiple Choice, Inc.

Loretta P. Dodgen, Ed. D.

Dr. Loretta P. Dodgen, co-founder of Multiple Choice, Inc., business coaching firm, has extensive experience in building the capacity of organizations. In addition to organizational development, Loretta serves as an executive coach for professional growth and executive leadership. She completed her doctoral studies in leadership at the University of NC at Greensboro concentrating in the area of business studying organizational change through the integration of acquisitions and mergers.

Multiple Choice, Inc. added Human Capital Solutions Group as a subsidiary with Loretta serving as a partner. HCSG provides comprehensive solutions for credit unions in Human Capital Management and Organizational Development through two service suites- Human Resources and Talent Management and Strategic including Human Capital Strategy and Succession Planning. Dr. Dodgen is a regular presenter and panel expert for credit union conferences across the United States. Her service areas include board development, strategic planning, compensation strategies, and human capital management. Clients include Northwest Federal Credit Union, Strategic Air Command Federal Credit Union and numerous federal and state chartered credit unions across the country.

Dr. Dodgen was an incorporator and director for First Gaston Bank where she served as Chairman of the Board. She also served on the Board of Directors for Integrity Financial Corp, a multibank holding company. Loretta is a regular conference presenter on Maximizing Your Human Capital and has served on the faculty for North Carolina Bank Commission Directors' College and the National Association of Federal Credit Union's Management Development Institute at Duke University.

Malinda B. Lowery, Ed. D.

Dr. Malinda B. Lowery is co-founder of Multiple Choice, Inc. She is a consultant to organizations from government to Fortune 100 corporations. She completed her doctoral studies in Leadership at the University of North Carolina at Greensboro concentrating in the area of business studying leader vision and its impact on team development. She holds a Bachelor of Arts degree in Psychology and a Master's Degree in Supervision.

She works with numerous corporations from small companies to international organizations across the United States. Multiple Choice provides two areas of services for clients:

- 1) Strategic solutions for corporations such as strategic planning, succession planning, executive coaching, human capital gap analysis, leadership development, team development and;
- 2) Human resource tools such as personnel selection systems, performance management systems, bonus and incentive program design, employee search and recruiting, and compensation and position analysis.

A second company was formed called Human Capital Solutions Group. Dr. Lowery is a partner and Senior Consultant for the firm. HCSG provides comprehensive solutions for credit unions and community banks in Human Capital Management and Organizational Development through two service suites – Human Resources such as compensation and benefits reviews and Strategic including Human Capital Strategy and Succession Planning. Clients include credit unions throughout the United States. Dr. Lowery is a presenter at Federal Credit Union conferences and webinars across the US.

Metova, Inc.

G. B. Cazes, MBA, President

G.B. has worked with communities across the United States to design, develop and implement workforce development programs that drive economic development and create robust information technology ecosystems. Over the past 15+ years, G.B. has served in numerous leadership positions and worked in international, commercial, and government markets with companies ranging from Fortune 100 to startups.

Previously, G.B. served as Vice President of the Cyber Innovation Center (CIC) and Director of the National Integrated Cyber Education Research Center (NICERC). As Vice President of the CIC, Mr. Cazes was responsible for developing a robust cyber ecosystem that leveraged unique assets from across the region to create an economic development engine that drove the development of a cyber-economy. Mr. Cazes' responsibilities ranged from fostering collaboration among government, industry, and academia to program development to create physical spaces, such as the National Cyber Research Park, to support technological innovation, research, and technology transfer.

As Director of the National Cyber Education Research Center, G.B. led the design, development, and implementation of a national academic outreach and workforce development program aimed at building a cyber-workforce for the future. While this program was designed to organically grow a knowledge-based workforce in northwest Louisiana, it was recognized as a national model for cyber education by the Department of Homeland Security and is currently being implemented across all 50 states and multiple US territories. Mr. Cazes believes that teachers are the key to systemic and sustainable change and secured over \$20 million in federal grants to support content development and professional development for teachers.

Jeff Amerine (PMP), Principal, Startup Junkie Consulting

Jeff is one of the key leaders nationally involved with the creation of lasting regional venture/startup ecosystems. Jeff has held senior leadership positions in nine startup ventures and three Fortune 500 companies and has made more than 80 angel investments in early-stage ventures. Jeff now leads Startup Junkie Consulting, a venture catalyst company that helps drive the startup movement in emerging regions. Jeff served as the Associate Vice Provost, Research and Economic Development and Director of Technology Ventures at the University of Arkansas until leaving to pursue Startup Junkie Consulting full-time in January 2015. His work at the University covered every aspect of the commercialization of life science, biotech, medical devices, healthcare information technology, pharma, and other areas of scientific and technical innovation.

In addition, Jeff is an adjunct professor and teaches entrepreneurship at the Sam M. Walton College of Business. Jeff is also a retained advisor for Innovate Arkansas, a Winrock International program chartered with the creation and support of a knowledge-based economy in Arkansas that has accounted for over \$300 million in public and private financing for Arkansas-based startups.

Recently, Jeff's venture ecosystem catalyst company, Startup Junkie Consulting, was successful in being awarded long-term funding from Winrock International, the Walton Family Foundation, and the Small Business Administration to foster the growth and improvement of the Northwest Arkansas venture ecosystem, and for the enhancement of the Ozarks Regional Innovation Cluster (ORIC). The ORIC award was one of four competitively-selected regional innovation clusters out of fifty applicants nationwide. See video of Jeff here describing the NWA regional innovation cluster: <https://www.youtube.com/watch?v=gyPdmKQC9QI>

Jeff also appears regularly on the 8th & Walton Focus on Suppliers show on Arkansas NBC-affiliate KNWA and YouTube. Each week thought leaders and emerging startups discuss new technologies that can drive brand competitive advantage.

Prior to all of this, Jeff served six years as a United States Air Force officer working in the Strategic Air Command as a missile launch officer, and later in research and development acquisition. Jeff graduated from US Naval Academy in 1984 and holds a Master of Science in Operations Management from the University of Arkansas. He is a certified Project Management Institute Project Management Professional (PMP).

Alexa Williams, Director, Research Analyst

Alexa has a variety of marketing experience that spans from graphic design and visualization, to market research and analysis with areas of expertise that include, but are not limited to, graphic design, logo creation, branding, market research, A/B testing, website visitor analysis, search engine optimization, marketing plan development, social media management, copywriting, and marketing strategy.

Alexa works directly with clients from various industries including education, cosmetics, food, labor, housing, and technology. In addition to hands-on experience working in the creative marketing community, Alexa has an education in management and marketing and utilizes her professional and educational experience to develop customized marketing plans based on research data and marketing best practices. Through in-depth marketing research into an entity's target audience, Alexa has been able to analyze and develop customized marketing and implementation plans for a diverse list of multiple clients.

As a research analyst on the project, Alexa has assisted in gathering and analyzing numerous amounts of valuable data to be compiled and utilized in the plans and recommendations presented. In addition, Alexa is overseeing and assisting with the creation and implementation of the new website.

Phyl Amerine, Executive Consultant, Startup Junkie Consulting

Phyl has worked as a volunteer and advisor in nonprofit marketing for over 12 years. She has been involved in the creation of eight startups. She holds the honor of having been recognized by Governor Mike Huckabee for her volunteer work. Phyl attended Bowie State University, where she majored in Communications. She began her professional career as a daily newspaper reporter covering the Wyoming state government and the early careers of Dick Cheney and Alan Simpson. In her first startup, she was responsible for developing all market strategies for international licensing and partner selection with significant emphasis in Korea, China, Spain, Dominican Republic, Vietnam, Singapore, and India. She defined market opportunity and strategy for one of the initial Internet Service Providers (ISPs) in India. In another startup, she formed a strategic relationship with a Korean-based international telecommunications carrier, successfully gained FCC 214 licensing for US operations, and served as General Manager of Marketing. Phyl is also currently active in the local investment community.

Phyl's expertise and skills are in the following areas: coaching, mentoring, marketing, strategy, assumption testing, social ventures, entrepreneurship, and entrepreneurial ecosystem development.

Invitation Letter to Participate in the Survey

April 3, 2017

Company Name
Address
City, State, Zip

Attn: Human Resource Manager

South Carolina Act 252** created the Coordinating Council for Workforce Development (CCWD), to be Chaired by the Secretary of Commerce, whose purpose is "...TO MEET CERTAIN CURRENT AND FUTURE WORKFORCE NEEDS...". Based on industry labor projections and strategic statewide initiatives, this 10-member, public-private partnership with representation from economic and workforce development, education and the business community will initially focus on workforce development opportunities in manufacturing, healthcare, and digital and information technology.

The Council is requesting your assistance in providing critical data about your workforce that will ultimately impact CCWD recommendations, implementation of new programs/initiatives, and provide guidance for changes to existing ones based on your business needs. The creation of a detailed workforce database will provide a strong working baseline measure that will support and enhance growth through employment, education and training opportunities for the companies of our State.

Please complete the survey conveniently located online at <https://www.surveymonkey.com/r/Workforce-Survey2017>, or by filling out the attached hard copy by April 14, 2017, and return to the SC Department of Commerce, 1201 Main Street, Suite 1600, Columbia, South Carolina 29201.

While aggregate information may be disclosed to third party partners, the responses by individual companies will be maintained by the SC Department of Commerce as confidential information that is not subject to disclosure. After compiling the data, information will then be made available as to how to access this publically.

We sincerely appreciate your support of this critical initiative created to support the growth of industry in South Carolina. Please call me if you have any questions or wish to discuss further.

Thank you for your support,

Robert M. Hitt III
Chair, SCCCWD
Department of Commerce Secretary

Tammy Mainwaring
Business Advisory Group
IT-oLogy President

**For more information about Act 252, please go to http://www.scstatehouse.gov/sess121_2015-2016/bills/4145.htm

Workforce Survey

1. *Pre-populate this information at the beginning of the survey. You already know this; also shows it is a survey specifically for them, not just a "form"*
 - a. Company Name
 - b. Address
 - c. County
2. What is the primary business activity of this company?
3. How long has this facility been in operation?
 - a. Less than 1 year
 - b. 1-5 years
 - c. More than 5 years
 - d. Not yet in operation
4. How many people are currently employed at this location? *(include full-time and contract employees)*
5. Approximately how many positions are currently classified as "open" at this location?
6. In the last 12 months, the number of employees at this location has:
 - a. Increased
 - b. Decreased
 - c. Remained About the same *(if answer this, skip the next two questions)*
7. What type of employees accounted for the majority of the increase or decrease experienced over the past year?
 - a. Skilled
 - b. Unskilled
8. What circumstances would you attribute the increase or decrease in the number of employees over the past year? *(select all that apply)*
 - a. Revenue/Profitability factors
 - b. Evolution of our business focus
 - c. Competition for workforce
 - d. Changes in necessary skillsets
 - e. Automated technology
 - f. Other _____
9. How does the turnover rate at this facility compare to the industry average?
 - a. Higher
 - b. Lower
 - c. About the same
10. In the next 1-5 years, the number of employees at this location is expected:
 - a. Increase
 - b. Decrease
 - c. Remain about the same *(if answer this, skip the next three questions)*
11. Over the next 1-5 years, retirement attrition is expected to:

- a. Increase
 - b. Decrease
 - c. Remain about the same
12. What type of employees will account for the majority of the hiring expected over the next 1-5 years?
- a. Skilled
 - b. Unskilled
13. What circumstances are expected to drive the hiring practices over the next 1-5 years? (*select all that apply*)
- a. Revenue/profitability factors
 - b. Evolution of our business focus
 - c. Competition for workforce
 - d. Changes in necessary skillsets
 - e. Automated technology
 - f. Other _____
14. What specific skill sets are expected to be the MOST difficult to fill at this facility over the next 1-5 years?
15. Why are these skill sets expected to be the most difficult to fill?
16. As it relates to your anticipated workforce over the next 1-5 years, how concerned are you regarding the availability of a local workforce with the following qualifications? (*5 pt. scale from very concerned to 1, not at all concerned*)
- a. Entry level
 - b. 1-3 years experience
 - c. 4-10 years experience
 - d. Management level
 - e. High school diploma
 - f. Special skill certificates
 - g. Associates degree
 - h. Four-year degree
 - i. Post-graduate degree
 - j. Executive management
 - k. Sales management
17. What resources are used for workforce recruitment (*all that apply*)?
- a. Staffing agencies/firms
 - b. State or public jobs board
 - c. Private jobs board
 - d. Company website
 - e. Word of mouth
 - f. Social media
 - g. Online platform
 - h. Mobile advertising
 - i. Other (please specify)
18. Are you interested in a follow-up call from the SC Department of Commerce to further discuss workforce opportunities, challenges, solutions or resources?
- a. Yes (*please provide contact information*)
 - b. No

This section will be open-ended questions that are IT Workforce specific.

19. Please describe your current IT staffing needs. What specific skills do you need in terms of programming languages, design, project management, infrastructure, data analytics, cyber security, etc.?

20. As you look forward over the next one, three, and five year period what are your projected future IT staffing needs?

21. What are your current sources of IT talent? Please be as specific as possible and provide numbers of hires from various sources.

22. How would you describe your specific successes and challenges in finding quality IT staff? What would you recommend as a course of action to address specific challenges?

23. When you hire in new IT staff what are you seeing as specific skills shortfalls – both technical and/or professional? What are you doing to address these shortfalls and what should the state or other institutions be doing?

24. How would you characterize your internal onboarding and training programs and their level of effectiveness for IT staff? How long does it typically take to make a new hire productive? Please be specific as it relates to source of new hire, years of experience, etc. What does it cost you to make a new IT staff hire productive on average?

25. Please talk about your IT staff turnover. What is your current level of IT staff churn? Why do you lose IT staff and what do you do to address turnover? What specific IT skills do you most frequently lose?

Interview Guide

For the individual completing this survey, please complete the following:

Name:

Title:

Phone:

Email:

1. Please describe your current IT staffing needs. What specific skills do you need in terms of programming languages, design, project management, infrastructure, data analytics, cyber security, etc.?
2. As you look forward over the next one, three, and five year period what are your projected future IT staffing needs?
3. What are your current sources of IT talent? Please be as specific as possible and provide numbers of hires from various sources.
4. How would you describe your specific successes and challenges in finding quality IT staff? What would you recommend as a course of action to address specific challenges?
5. When you hire in new IT staff what are you seeing as specific skills shortfalls – both technical and/or professional? What are you doing to address these shortfalls and what should the state or other institutions be doing?
6. How would you characterize your internal onboarding and training programs and their level of effectiveness for IT staff? How long does it typically take to make a new hire productive? Please be specific as it relates to source of new hire, years of experience, etc. What does it cost you to make a new IT staff hire productive on average?
7. Please talk about your IT staff turnover. What is your current level of IT staff churn? Why do you lose IT staff and what do you do to address turnover? What specific IT skills do you most frequently lose?

CHARACTERIZATION OF THE INTERVIEWED ORGANIZATIONS

Organization Description	Region	Size	Interviewee Role
State Agency	Midlands	Large	Executive
State Agency	Midlands	Large	Executive
Non-profit	Midlands	Small	Executive
Higher Education	Upstate	Large	Administrator
2Yr Technical Education	Upstate	Large	Administrator
Healthcare IT	Midlands	Large	Recruiter
Public Utility	Midlands	Large	Executive
Telecommunications	Midlands	Medium	Executive
Technology Services	Midlands	Large	Executive
Economic Development	Low Country	Medium	Executive
Technology Services	Low Country	Large	Recruiter
Technology Services	Low Country	Small	Executive
Technology Services	Low Country	Small	Recruiter
Non-profit	Midlands	Medium	Executive
Agency	Midlands	Small	Executive
Non-profit	Upstate	Small	Executive
Technology Services	Midlands	Medium	Executive

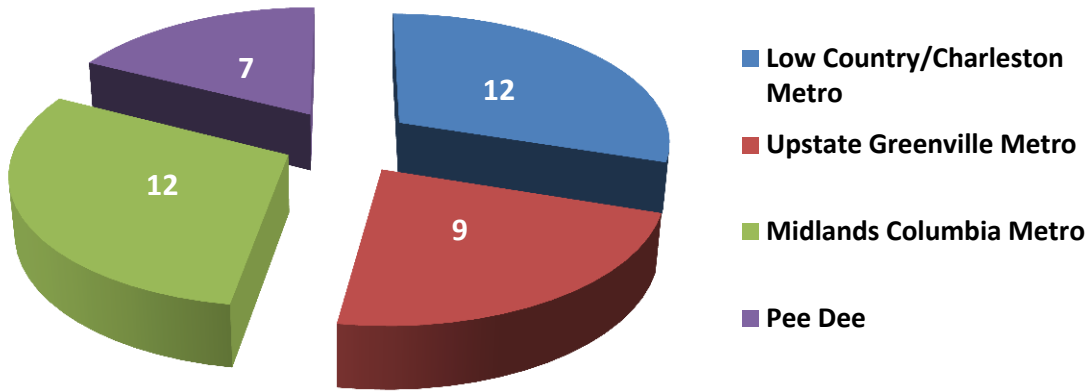
Source: Metova Inc., Multiple Choice Inc.

CHARACTERIZATION OF THE INTERVIEWED ORGANIZATIONS (Cont.)

Organization Description	Region	Size	Interviewee Role
Technology Services	Low Country	Small	Executive
Technology Services	Low Country	Small	Recruiter
Technology Services	Low Country	Small	Recruiter
Technology Services	Low Country	Medium	Executive
Technology Services	Pee Dee	Small	Recruiter
Technology Services	Pee Dee	Medium	Recruiter
Non Profit	Upstate	Small	Executive
Technology Services	Upstate	Medium	Recruiter
Non Profit	Low Country	Small	Executive
Non Profit	Pee Dee	Small	Executive
Technology Services	Pee Dee	Large	Executive
Technology Services	Pee Dee	Large	Executive
Technology Services	Low Country	Small	Owner
Technology Services	Low Country	Small	Owner
Technology Services	Low Country	Small	Management
Technology Services	Upstate	Small	Owner
Technology Services	Upstate	Small	CEO
Technology Services	Upstate	Small	Management
Technology Services	Upstate	Small	President
Technology Services	Midlands	Small	HR Director
Technology Services	Midlands	Small	Owner
Technology Services	Pee Dee	Small	Owner

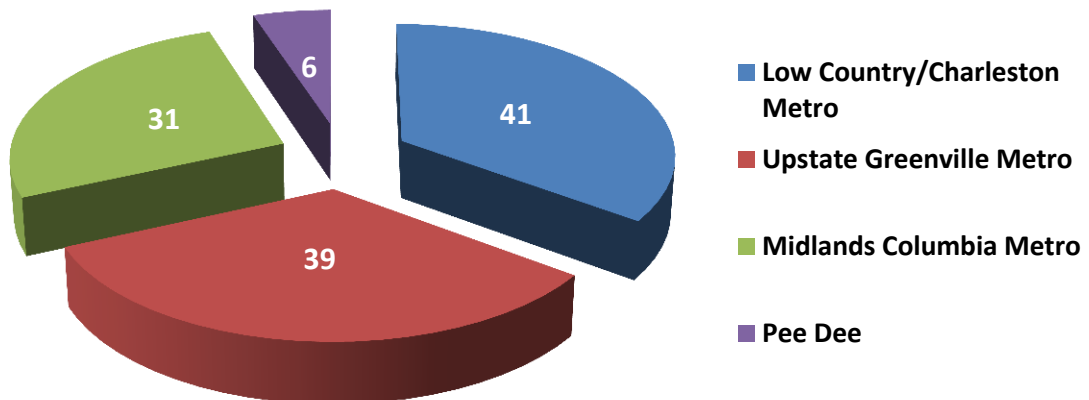
BREAKDOWN OF INTERVIEWS BY REGION

South Carolina Employer Interview Survey Regional Distribution



Source: IT-oLogy, Metova, Inc., MCI, Inc.

South Carolina Employer Online Survey Regional Distribution



Source: IT-oLogy, Metova, Inc., MCI, Inc.

