

Software Development Competencies Survey

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TECNA

Technology Councils of North America

Agenda

- Survey objective
- Data collection process
- Population and sample
- Results
- Limitations
- Implications for stakeholders
- Next steps



Survey Objective

Understand
workforce
development issues
in software
development
occupations

Mobile developer

Application developer

Web developer



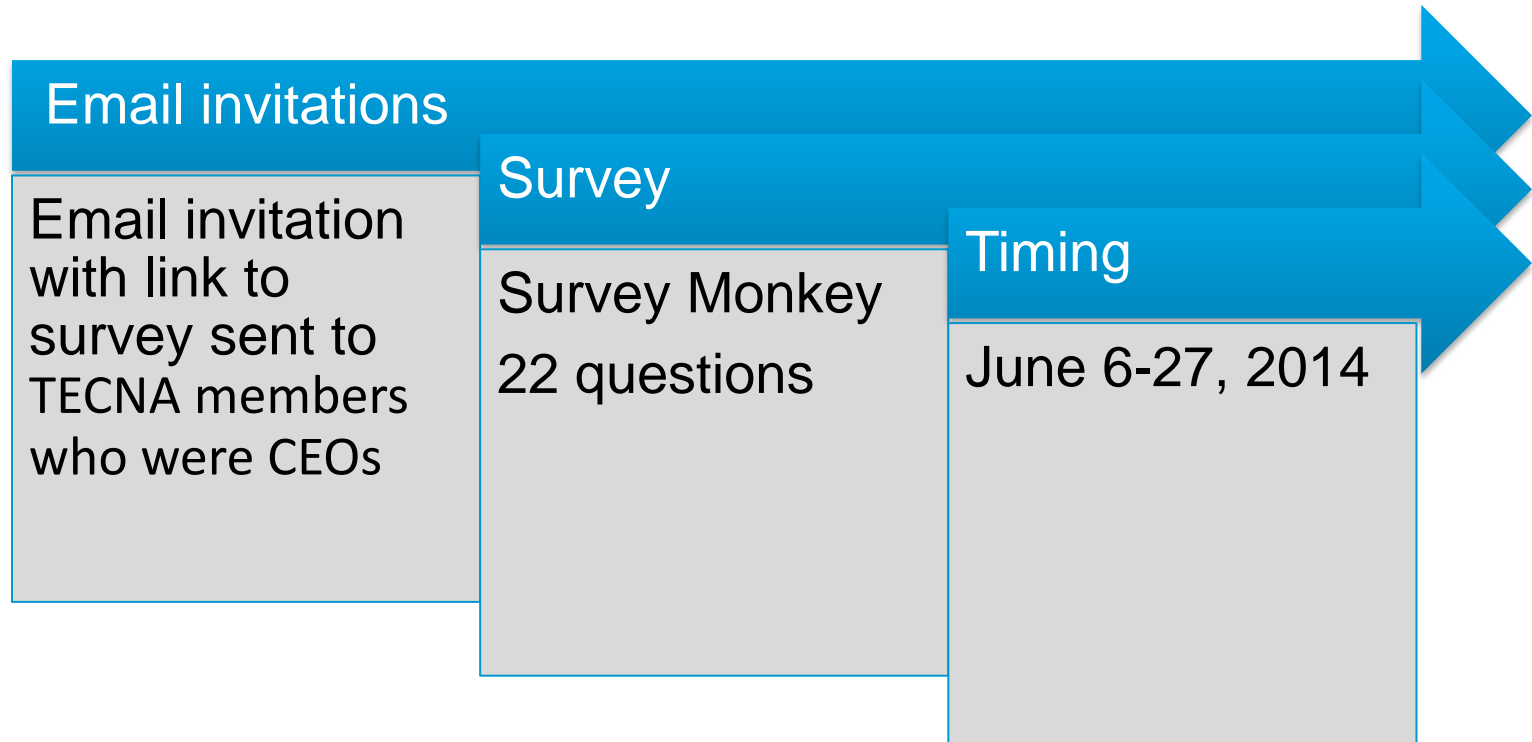
- **Question 1:** What is the primary reason for the reported talent shortage in the software development sector (quantity or quality)?
- **Question 2:** What 3-5 most critical skills must individuals have to perform effectively in three high-demand software development roles in the next 2-4 years?
- **Question 3:** What education and certificates will be required by individuals in the next 2-4 years to perform successfully in three high-demand software development roles?
- **Question 4:** What are employers doing to cope with future anticipated skill gaps in three high-demand software development roles?



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Data Collection Process



Population and Sample

Population Criteria

1. Manager or higher role or a recruiter
2. Organization employs or helps recruit software developers or software engineers

Sample

$N = 760$

29 states

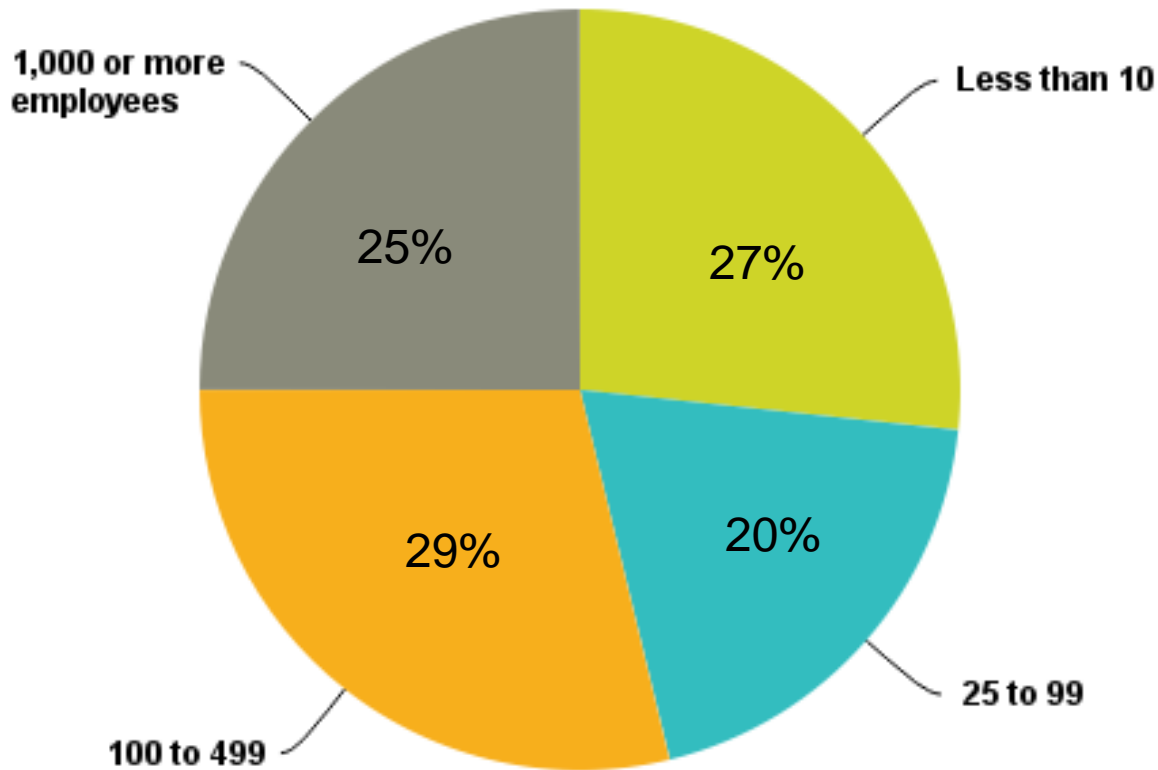
3 Canadian provinces

Results: Percentage of Respondents by Industry and State

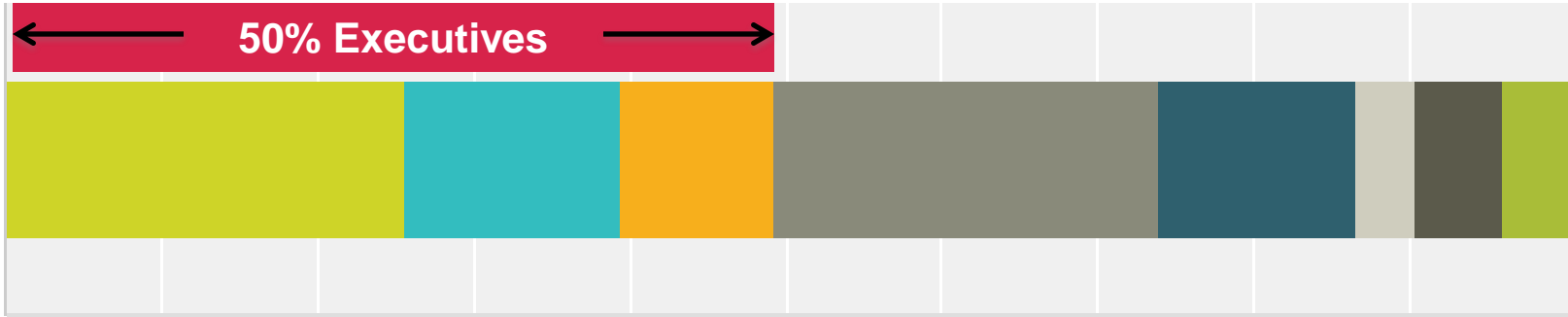
Most represented industries	Percent of sample
Information technology	40%
Independent software vendor	10%
Other industry sector	8%
Financial/banking/insurance	8%
Healthcare/medical	7%
Education	4%
Professional services	4%
Government	4%
Telecommunications	4%
Total	87%

Most represented states	Percent of sample
Massachusetts	18%
Pennsylvania	14%
Idaho	14%
Colorado	6%
New Hampshire	6%
Utah	5%
Alabama	5%
North Carolina	4%
Georgia	4%
Nebraska	4%
Texas	3%
Total	83%

Results: Percentage of Respondents by Size of Organization



Results: Current Position



0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

- Senior Executive (CEO, President, Owner, etc.)
- Executive – IT function (CIO, CTO, VP or equivalent)
- Executive – Business function (CFO, CMO, COO, VP or equivalent)
- Middle Management – IT function (Director, Manager, Team Leader etc.)
- Middle Management – Business function (Director, Manager, Team Leader etc.)
- HR Manager
- Recruiter
- Other (please specify)

Question 1: What is the primary reason for the reported talent shortage in the software development sector (quantity or quality)?

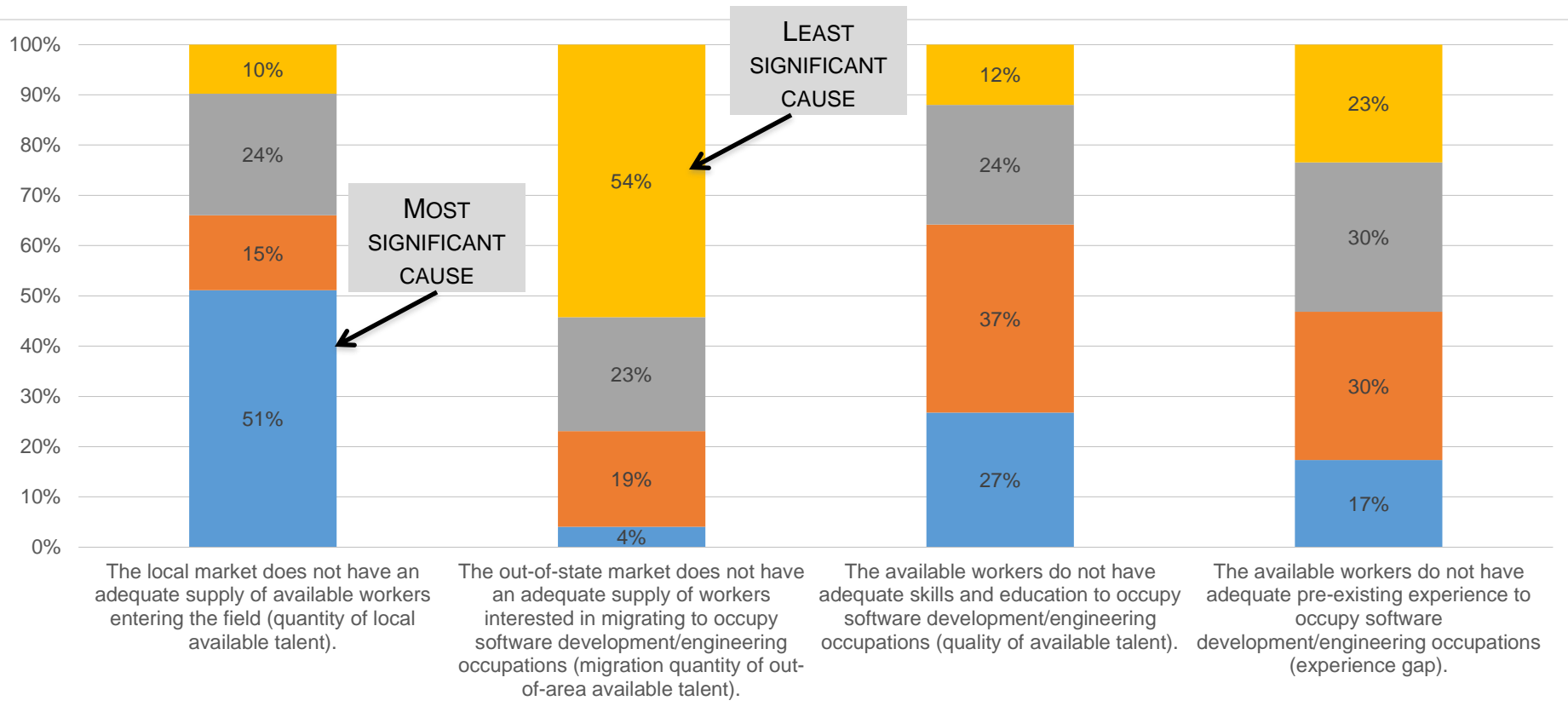
Is there a talent shortage?

Yes	83%
No	17%

Greatest talent shortage

Application developer/programmer	61%
Mobile developer	14%
Other	14%
Web developer	11%

Question 1: What is the primary reason for the reported talent shortage in the software development sector (quantity or quality)?



Question 2: What 3-5 most critical skills must individuals have to perform effectively in three high-demand software development roles in the next 2-4 years?

Mobile Developer	
User interface design	67%
Java	61%
JavaScript	50%
Software architecture	50%
Object-oriented analysis and design	43%

Application Developer/Programmer	
Software architecture	63%
Java	59%
Object-oriented analysis and design	49%
SQL programming	48%
Microsoft.NET (C#)	43%

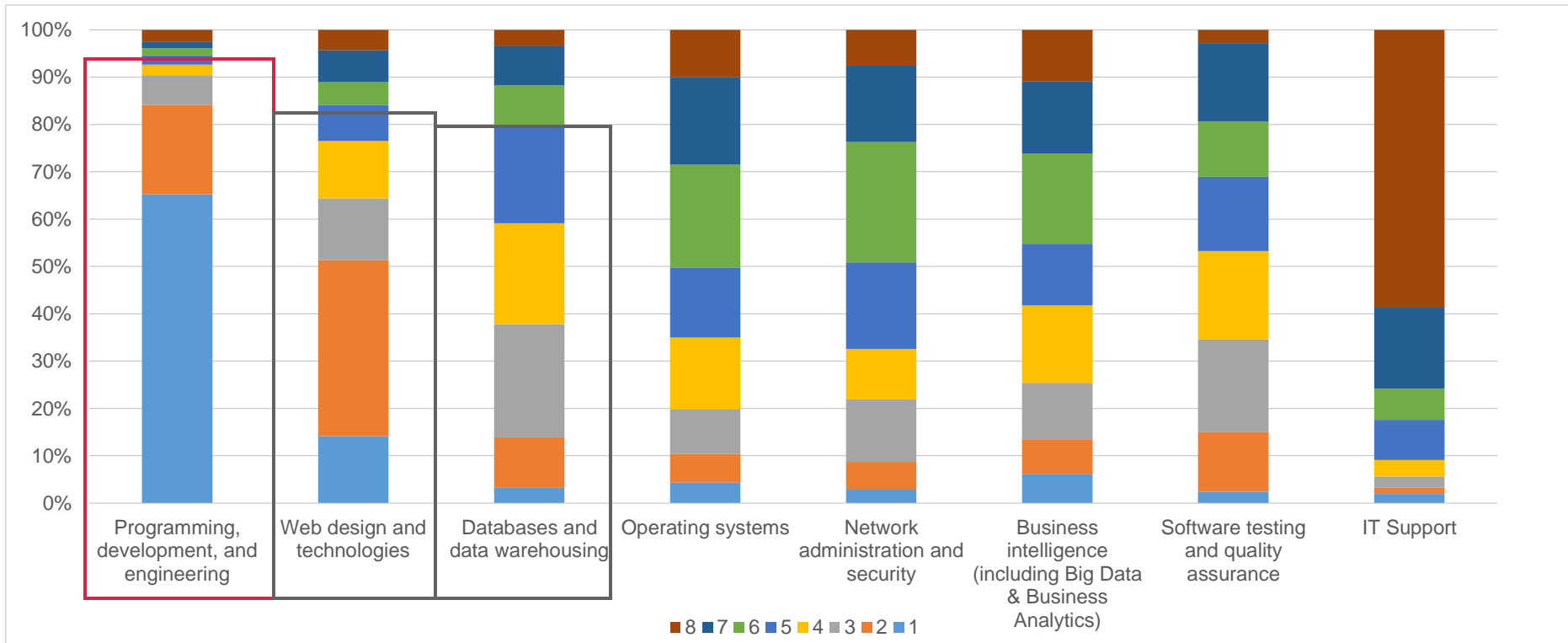
Web Developer	
User Interface design	65%
JavaScript	64%
Java	44%
Software architecture	40%
Extensible markup language	34%

Question 2: What 3-5 most critical skills must individuals have to perform effectively in three high-demand software development roles in the next 2-4 years?

	Most Critical	Least Critical
Mobile Developer	Programming, development, and engineering (65%)	IT Support (59%)
Application Developer/Programmer	Programming, development, and engineering (77%)	IT Support (58%)
Web Developer	Web design and technologies (54%)	Programming, development, and engineering (59%)

Question 2: What 3-5 most critical skills must individuals have to perform effectively in three high-demand software development roles in the next 2-4 years?

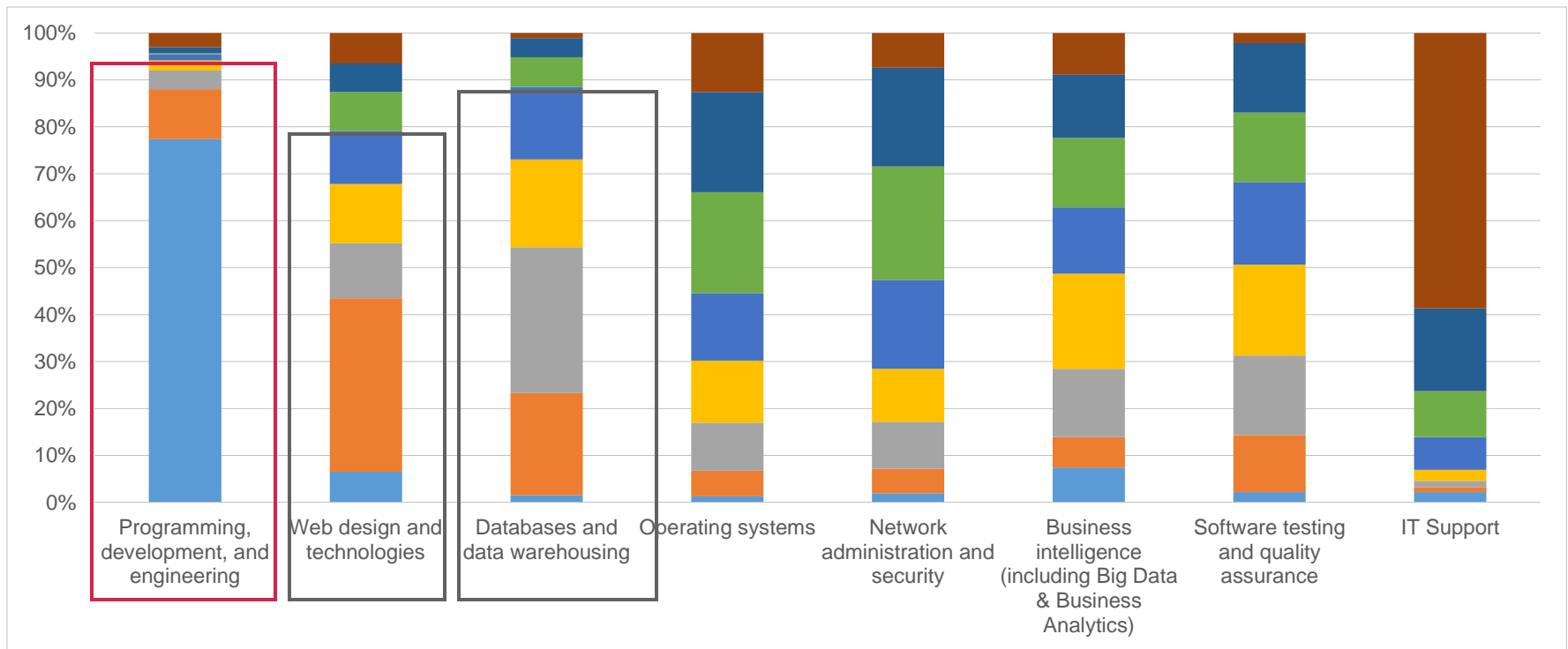
ROLE 1: MOBILE DEVELOPER



Numbers represent percent of individuals who ranked the skill from 1 to 8 (e.g., blue represents the percent of individuals who ranked programming as most critical)

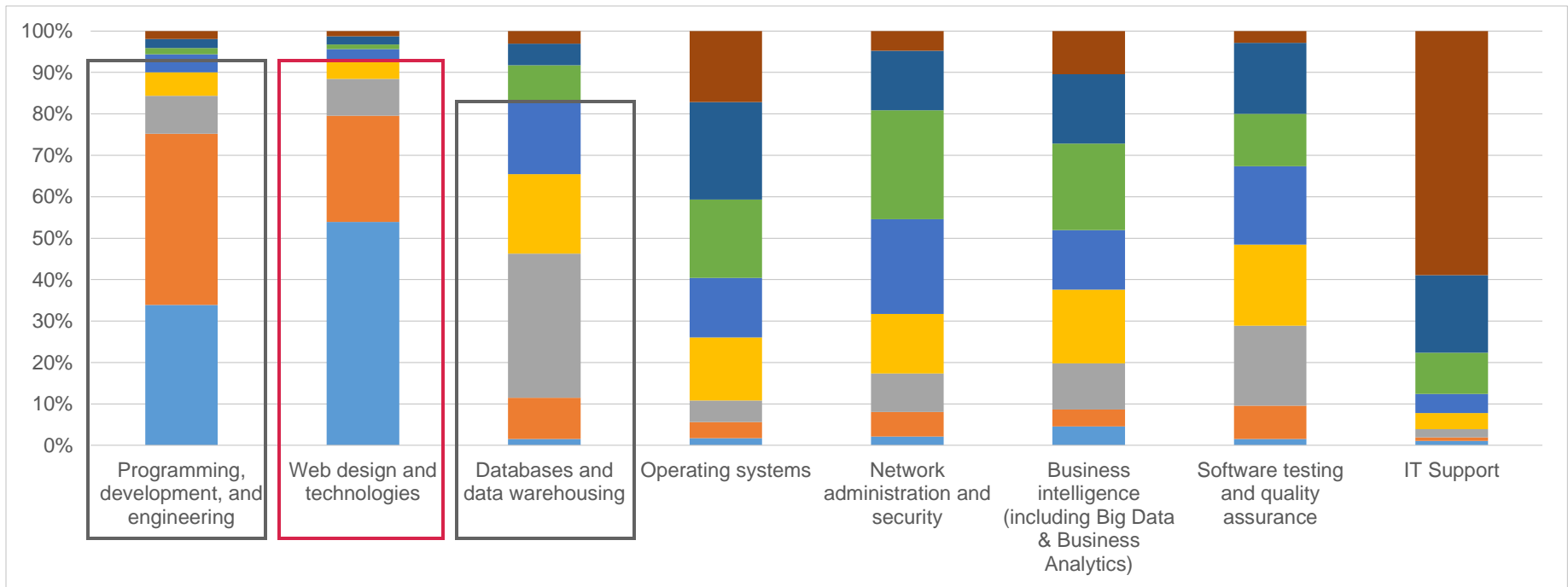
Question 2: What 3-5 most critical skills must individuals have to perform effectively in three high-demand software development roles in the next 2-4 years?

ROLE 2: APPLICATION DEVELOPER/PROGRAMMER



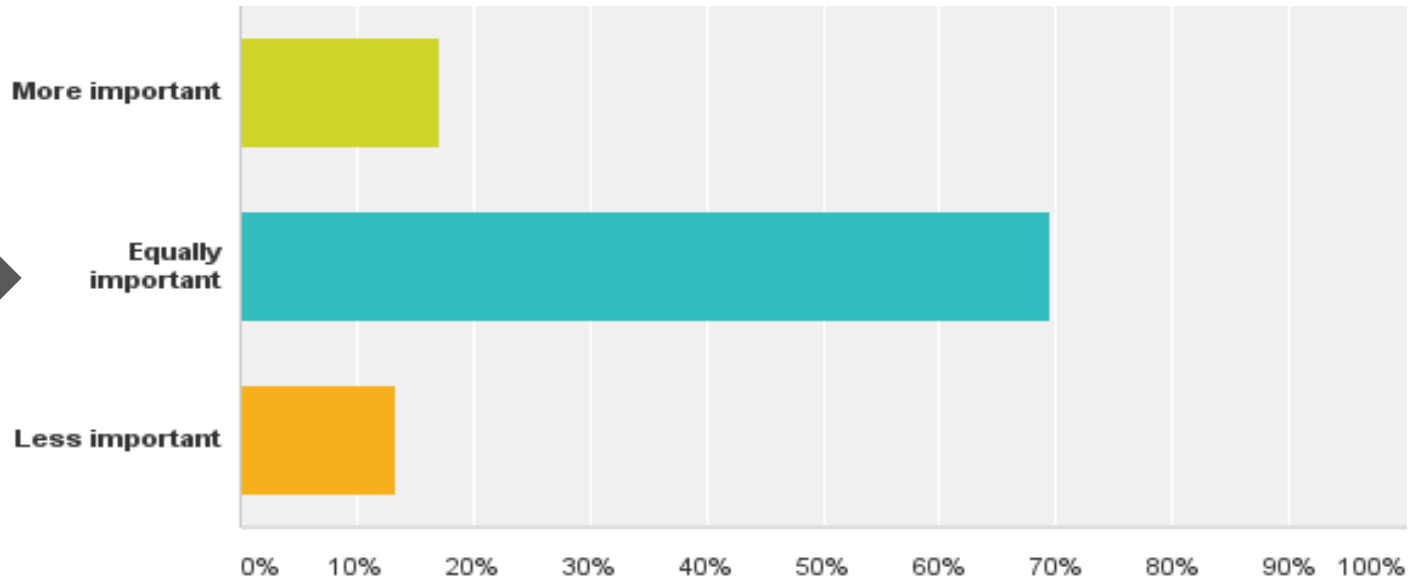
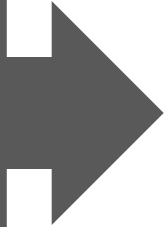
Question 2: What 3-5 most critical skills must individuals have to perform effectively in three high-demand software development roles in the next 2-4 years?

ROLE 3: WEB DEVELOPER

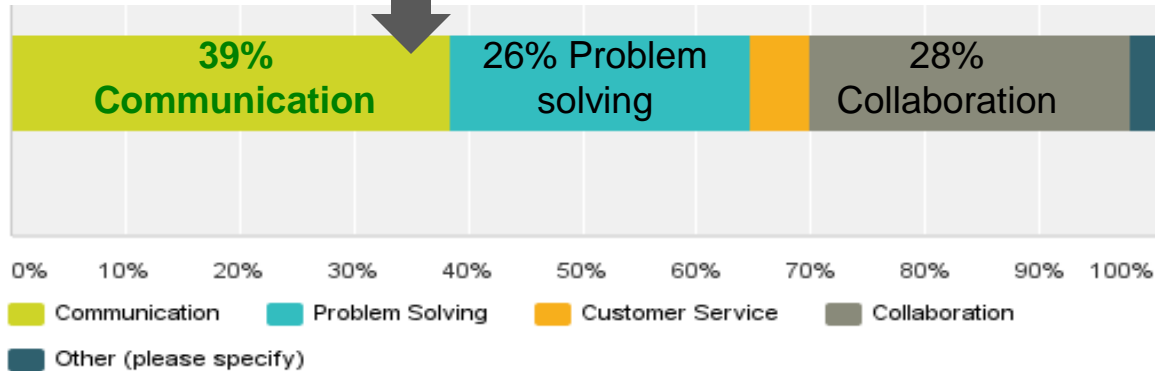


Soft Skills

Are soft skills more, equally, or less important to success than technical skills?



The top soft skill software developers/engineers (in all three roles) most need



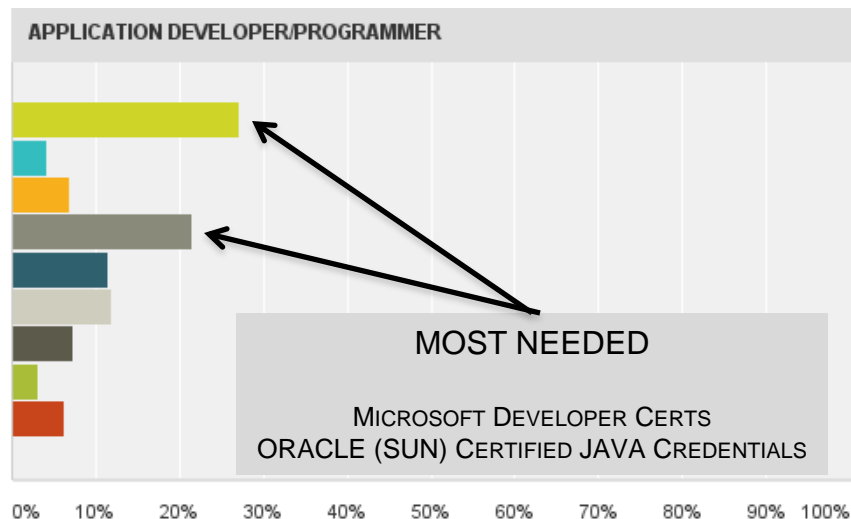
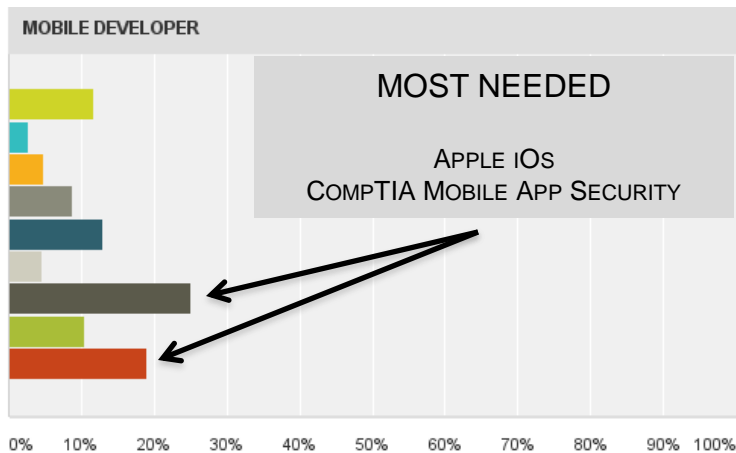
Question 3: What education and certificates will be required by individuals in the next 2-4 years to perform successfully in three high-demand software development roles?

Mobile Developer					
High school	Academic certificate	Associate's degree	Bachelor's degree	Master's degree	Doctorate
10%	5%	22%	60%	2%	0%

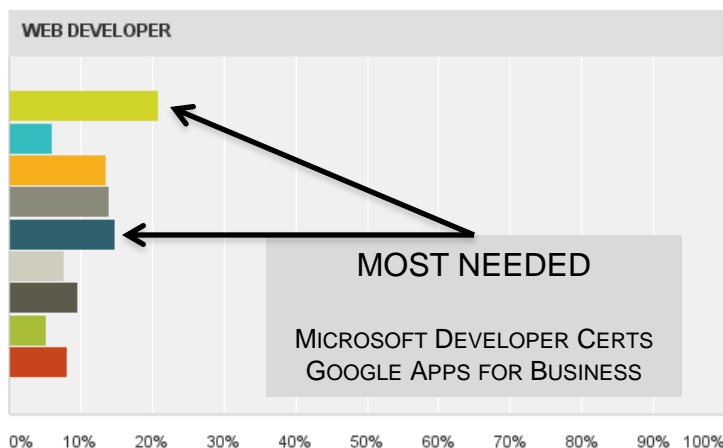
Application Developer/programmer					
High school	Academic certificate	Associate's degree	Bachelor's degree	Master's degree	Doctorate
8%	3%	11%	71%	7%	0%

Web Developer					
High school	Academic certificate	Associate's degree	Bachelor's degree	Master's degree	Doctorate
12%	7%	26%	54%	2%	0%

Question 3: What education and certificates will be required by individuals in the next 2-4 years to perform successfully in three high-demand software development roles?



- Microsoft Developer Certs (i.e. MCSD)
- Zend Certified Engineer (ZCE)
- Adobe Certified Expert for Developers (ACE)
- Oracle (SUN) Certified JAVA Credentials (e.g. OCA, OCP, OCE)
- Google Apps for Business
- IEEE Certified Software Developer
- Apple iOS
- CompTIA Mobility+
- CompTIA Mobile App Security+ (iOS and Android)



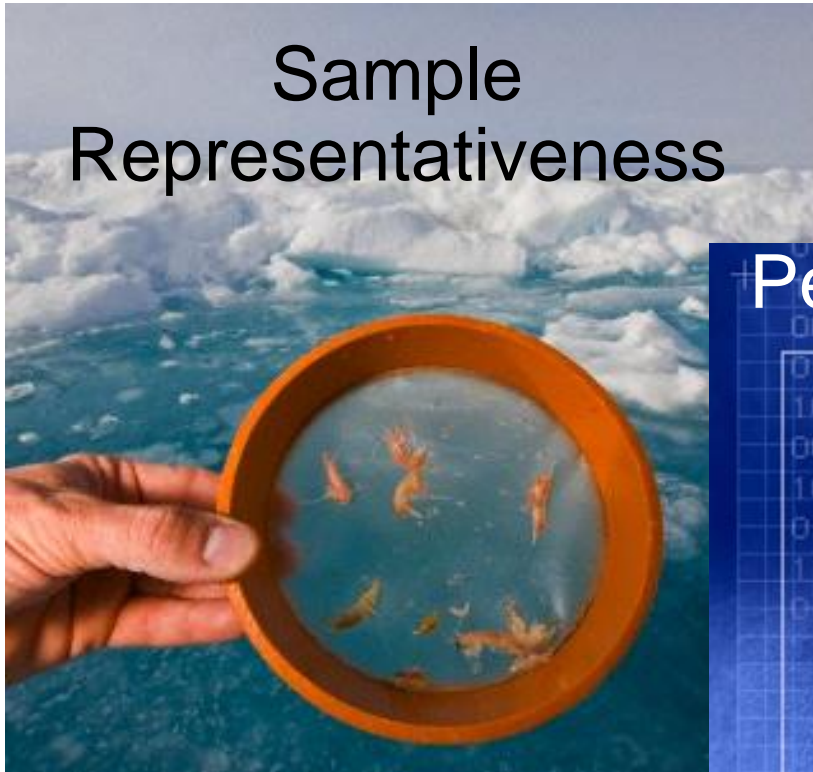
Question 4: What are employers doing to cope with future anticipated skill gaps in three high-demand software development roles?

69%
of employers are
taking action

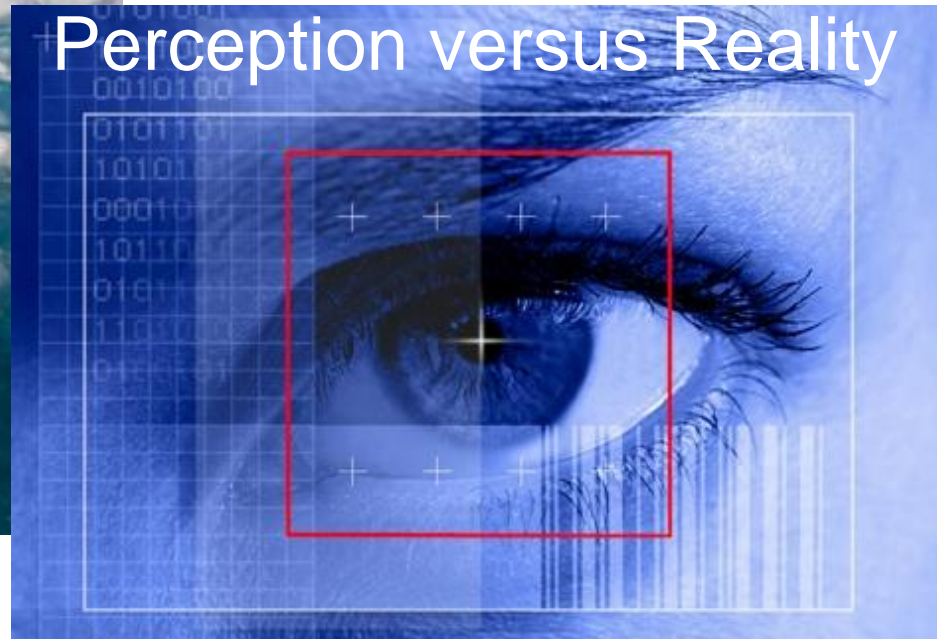
Coping mechanisms	
Conducting internal training	68%
Offering internships for students	64%
Retraining employees	53%
Network building	51%
Outsourcing work	42%
Hosting special events	38%
Establishing community college partnerships	29%
Hiring virtual employees	24%

Potential Limitations

Sample
Representativeness



Perception versus Reality



Implications?

Employers



Education



Technology Councils





Talent shortage	Critical skills	Degrees	Coping
Partner with local educational institutions to increase pipeline	Partner with local educational institutions to educate and offer expertise		Evaluate consequences of not taking action Evaluate ROI of training to fill quantity gap
Implement programs to increase student interest in pursuing relevant career opportunities	Evaluate curriculum to ensure focus on most critical technical and soft skills	Evaluate and adjust the mix of program offerings-- certificates, associate's and bachelor's degrees--to sustain the talent pipeline	
Law of Attraction Identify creative outsourcing resource partners Create a regional software alliance	Focus on specific deliverables and language support Conduct additional studies on upcoming	Organic growth through K-12 and universities Partner with Code.org – CS in HS curriculum/train teachers	Provide a forum through councils for companies to ideate solutions, merge resources/efforts

Next Steps



Fall 2014

Virtual roundtable with industry / education leaders



Early 2015

Full report of findings