Information and Communication Technologies (ICT) is the sector that develops products and services in telecommunications, video gaming, cybersecurity, data analytics and bioinformatics. Analysis in this report focuses on 11 ICT occupations that play a vital role across industries. This report is an update to the 2014 research that initially identified ICT as a Priority Sector in San Diego County. The full report examines recent employment trends in the sector, specifically highlighting how the sector has evolved.

Visit workforce.org/reports to read the full report.

**HISTORICAL EMPLOYMENT TRENDS FOR 11 KEY OCCUPATIONS**

ICT employment in key occupations took a slight hit during the 2007–2009 recession, but has since surpassed 2006 levels. While both growing steadily, key ICT job growth has been faster across California as a whole, likely due to the growth in large tech hubs like the Bay Area.

![Graph showing historical employment trends for 11 key ICT occupations in San Diego County and California from 2006 to 2016.](image)

**ICT FAST FACTS**

- Qualcomm Inc. is the largest ICT employer in the region.
- 45,354 overall jobs in 2016 (in 11 key occupations).
- 31 educational programs trained for 11 key ICT occupations in 2015, resulting in 2,401 graduates.
- The median hourly wage for these workers was $41.47 as of 2016.

**GROWING NEEDS IN THE INDUSTRY**

The ability to manipulate, analyze and present data is becoming more important due to the growing need to use quantitative measures to drive decision-making. Recognizing this trend, the Bureau of Labor Statistics has proposed the addition of “Data Scientists” as a Standard Occupational Classification (SOC) in the 2018 revision to their system for classifying occupations.

**GENERAL RECOMMENDATIONS**

- Technical skills in this field (e.g., programming languages) are typically relevant to several occupations. Community colleges and training providers should focus on offering classes that develop specific skills, and should help students to understand the wide variety of careers each skill could apply to.

- To meet the needs of employers in the sector, workforce development strategies for ICT occupations should be built on four components: education, technical skills & experience, career navigation & continual learning, and communication & relevant non-technical skills. This can be achieved by creating training experiences that include both certification attainment and hands-on experience.
11 KEY ICT OCCUPATIONS IN SAN DIEGO COUNTY, 2016

<table>
<thead>
<tr>
<th>OCCUPATIONS</th>
<th>TYPICAL ENTRY-LEVEL EDUCATION</th>
<th>2016 JOBS</th>
<th>2013–2016 CHANGE</th>
<th>MEDIAN HOURLY EARNINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Developers, Applications</td>
<td>Bachelor's degree</td>
<td>10,032</td>
<td>8%</td>
<td>$49.04</td>
</tr>
<tr>
<td>Software Developers, Systems Software</td>
<td>Bachelor's degree</td>
<td>7,581</td>
<td>11%</td>
<td>$55.40</td>
</tr>
<tr>
<td>Computer User Support Specialists</td>
<td>Some college, no degree</td>
<td>6,491</td>
<td>4%</td>
<td>$26.63</td>
</tr>
<tr>
<td>Computer Systems Analysts</td>
<td>Bachelor's degree</td>
<td>5,626</td>
<td>9%</td>
<td>$44.53</td>
</tr>
<tr>
<td>Network and Computer Systems Administrators</td>
<td>Bachelor's degree</td>
<td>3,714</td>
<td>4%</td>
<td>$38.93</td>
</tr>
<tr>
<td>Computer Programmers</td>
<td>Bachelor's degree</td>
<td>3,472</td>
<td>0%</td>
<td>$38.06</td>
</tr>
<tr>
<td>Computer Network Support Specialists</td>
<td>Associate degree</td>
<td>2,347</td>
<td>5%</td>
<td>$34.20</td>
</tr>
<tr>
<td>Graphic Designers</td>
<td>Bachelor's degree</td>
<td>2,312</td>
<td>1%</td>
<td>$22.03</td>
</tr>
<tr>
<td>Web Developers</td>
<td>Associate degree</td>
<td>1,857</td>
<td>10%</td>
<td>$33.44</td>
</tr>
<tr>
<td>Database Administrators</td>
<td>Bachelor's degree</td>
<td>1,103</td>
<td>5%</td>
<td>$46.00</td>
</tr>
<tr>
<td>Information Security Analysts</td>
<td>Bachelor's degree</td>
<td>819</td>
<td>7%</td>
<td>$46.32</td>
</tr>
</tbody>
</table>

HIRING CHALLENGES

The positions most frequently identified by employers as hardest to fill are:

- Information Security Analysts: 22%
- Database Administrators: 22%
- Web Developers: 22%

The most frequently cited reasons for hiring difficulties are:

- Lack of Experience or Industry-Specific Knowledge: 39%
- Small Applicant Pool: 32%
- Insufficient Certifications: 23%

SKILLS ASSESSMENT

Skills that employers say are very important:

- Problem solving and critical thinking: 90%
- Technical skills: 81%
- Social and verbal communication: 67%

Important technical skills for applicants:

- Candidates with Amazon Webcloud Services (AWS) knowledge are in high demand. Clouds are more frequently being used for file storage and sharing.
- Web development, including an understanding of search engine optimization (SEO) is highly sought-after.
- Training in design thinking can make applications developers more valuable to a company.
- Stackable CompTIA certifications are commonly desired for ICT professionals. There is particularly high demand for cyber security professionals (Network+, Security+, CSA+, CASP).

RECOMMENDATIONS FOR JOB SEEKERS

- While a Bachelor’s degree may still be the most common pathway to enter many ICT positions, it is not the only way. Employers frequently place more emphasis on industry certifications than degrees. Many ICT professionals start with an entry-level position to learn about the industry, and choose the right certifications to pursue based on how their interests develop. This IT Certification Roadmap can help you navigate: https://certification.comptia.org/docs/default-source/downloadablefiles/it-certification-roadmap.pdf
- Develop your written and spoken communication skills. ICT professionals frequently need to communicate technical knowledge to a non-technical audience.
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