CLOSING ORANGE COUNTY’S SKILLS GAP

PREPARING TO MEET EMPLOYER DEMAND FOR MIDDLE-SKILL OCCUPATIONS
Around the world, employers, educators, policymakers, training organizations and others have recognized the critical importance of tackling the skills gap. Through New Skills at Work, a five-year $250 million global initiative, JPMorgan Chase will use its resources, expertise and global reach to help inform and accelerate efforts to support demand-driven skills training. The goal of this initiative is to help build economies that grow by investing in people so that workers and industries have the skills to compete and prosper in the global economy.

To complement this initiative, JPMorgan Chase launched New Skills for Youth, a five-year $75 million global initiative to address the youth unemployment crisis by investing in and fostering new and better training programs for young people. New Skills for Youth is designed to dramatically increase the number of young people who complete career pathways that begin in high school and end with postsecondary degrees or credentials allowing them to work in good-paying, high-demand jobs.

These are just two initiatives that JPMorgan Chase is pleased to lead that help people compete for jobs that can transform lives – and strengthen economies.

Workforce Development

JPMorgan Chase & Co.
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EXECUTIVE SUMMARY

Now that economic recovery is picking up steam, a key issue is re-emerging – the “skills gap,” defined as the perceived mismatch between the needs of employers for skilled talent and the skills possessed by the available workforce seeking employment. While Orange County continues to be the economic engine driving the Southern California economy forward, employers increasingly struggle to fill certain occupations with qualified individuals. As job growth continues to gain momentum, this skills gap could limit Orange County’s economic growth, job creation, and business competitiveness if not properly addressed.

A new reality for education and workforce training providers is that a significant segment of today’s labor force does not have the requisite skills demanded by employers. Many jobseekers, especially those who saw their skills and abilities languish while being unemployed during the recession, find themselves struggling to find full-time work. Together these realities suggest that the educational and employment training systems currently in place must evolve if they are to meet the task of preparing young adults for success in the years ahead.

In particular, the skills gap is increasingly expressed in terms of its significant effect on “middle-skill” jobs, which require more than a high school diploma but less than a bachelor’s degree. What does the future of the Orange County economy look like for 2016 and beyond in terms of middle-skill industry and occupational opportunities?

This report will cover:

- What is the current impact of middle-skills jobs on the Orange County economy?
- What industry clusters depend on key middle-skill occupations?
- What is the future of middle-skill jobs in the region?
- What are significant middle-skill education and workforce development drivers?

This report assesses Orange County’s current economic status, identifies major growth industries for middle-skill employment, and recommends potential career pathways and other ways to close the skills gap. In particular, the Healthcare, Information Technology, and Advanced Manufacturing industries, which together employ nearly half of Orange County’s 483,970 middle-skill workers, provide a strong foundation for Orange County’s future economic development.
ORANGE COUNTY’S ECONOMY AND JOBS CREATION ARE THRIVING

1,596,400 total labor force

4% unemployment rate (lowest since May 2007)

40,200 jobs over 2015

2.7% growth rate

22.4% High-skill jobs

$83,321 ave. salary

31.8% Middle-skill jobs

$53,110 ave. salary

43.5% Low-skill jobs

$31,371 ave. salary

15% growth over next decade

OC $25.98 hourly wage

$54,023 annual wage

CA $26.41 hourly wage

$54,920 annual wage

Healthcare

Information Technology

Advanced Manufacturing

= almost 1/2 of the region’s middle-skill jobs
Orange County has long served as an economic engine for the Southern California region, with its diverse industry clusters and deep talent pool driving economic, population, and employment growth. The Great Recession hit Orange County hard in 2008, causing many residents to lose their jobs and/or homes. The Orange County economy has since recovered and as of January 2016 boasts one of the state’s lowest unemployment rates (4.0 percent). Despite this growth, many Orange County residents still face tough economic challenges; filling open middle-skill positions could help residents participate in the current economic recovery.

Middle-skill occupations are defined as positions which do not require a bachelor’s degree but require training or some level of education above that of a high school diploma. This often means a certification or associates degree gained through community colleges or collaborative training programs between employers and educational institutions.

As technological advancements and business processes continue to evolve, the number of middle-skill occupations will continue to grow faster than the overall labor market and require an increasingly more educated and better prepared pool of workers to fill those positions.
Middle-skill occupations typically pay higher wages than regional averages and provide increased access to successful career paths for many students and jobseekers without a four-year college degree. This increase of potential earnings and career mobility, in turn, helps workers increase their overall standard of living and quality of life.

As technological advancements and business processes continue to evolve, the number of middle-skill occupations will continue to grow faster than the overall labor market and require an increasingly educated and better prepared pool of workers to fill those positions. In fact, 34 of the 50 fastest growing Orange County occupations (in terms of percentage growth) and 41 of the top 50 projected to create the most total job openings in the next decade will require less than a 4-year college degree. An estimated 17,678 middle-skill jobs will be created over the next decade, offering both higher than average wages and upward mobility. Filling this gap will not only improve the lives of those middle-skill workers but will also ensure the Orange County economy continues on its growth trajectory.

Preparing our education and workforce training system to meet employer demand for middle-skill jobs continues to grow in importance, both locally in Orange County and throughout California. For example, the California Workforce Development Board recently released the “California’s Unified Strategic Workforce Development Plan: Skills Attainment for Upward Mobility, Aligned Services for Shared Prosperity 2016-2020” to meet the goals and objectives of the federal Workforce Innovation and Opportunity Act (WIOA). The primary goal of the plan is to create “one million middle-skill industry-valued postsecondary credentials” with demonstrated labor market value.

According to WANTED Analytics, as of March 2016 the middle-skill job opening category took the longest to fill, with an average posting period of 57 days. Top middle-skills in particular high demand were:

- Bilingual
- Technical Support
- Quality Assurance
- Quality Control
- JavaScript
- Customer Relationship Management
- SQL (Structured Query Language)

With robust, relevant middle-skill training programs that truly develop the skills and abilities demanded by the labor market, young adults, recent graduates, and mid-career jobseekers in Orange County can “bridge the skills gap” and enter the middle-skill job market in meaningful ways and start to build sustainable careers.

A TALE OF TWO MIDDLES

A recent Brookings Institution report, “Job Market Polarization and U.S. Worker Skills: A Tale of Two Middles” distinguishes between two types of middle-skill jobs: “traditional middle” clerical jobs, which have declined, and “new middle” jobs in healthcare, IT, and other sectors, which see increasing demand. Unlike older middle-skill jobs, newer middle-skill jobs generally require post-high school education such as community college and/or certificate programs. Harry Holzer, a Senior Fellow at Brookings, professor at Georgetown and former Chief Economist for the U.S. Department of Labor reports similar findings and notes that sectors that feature high growth, such as healthcare, IT or advanced manufacturing demand technical skills and are more likely to experience shortages of qualified workers.

WORKFORCE OF THE FUTURE
STAKEHOLDER FOCUS GROUPS

The Orange County “Workforce of the Future” initiative, supported by JPMorgan Chase, brought together sector-specific employer stakeholder leaders to identify in-demand, emerging skill needs and explore best practices for improving the Orange County workforce development/talent supply chain in the Healthcare, Information Technology, and Advanced Manufacturing sectors. In partnership with the Orange County Department of Education (OCDE), OC Pathways and the Orange County Workforce Investment Board (OCWIB), OCBC organized industry-led focus groups made up of a wide variety of industry professionals from small, medium, and large Orange County employers to help identify industry sectors affected by the middle-skills gap, understand current and future workforce trends, and explore potential education and training solutions which could help mitigate the middle-skills gap in Orange County. These employer insights helped develop a unified vision for both the supply and demand sides of the Orange County’s future workforce ecosystem.

Session results will be highlighted in each respective section of this report.
MIDDLE-SKILL JOBS GROWTH IS CRITICAL TO OC ECONOMY

ISSUES

45% HR managers reported difficulty finding qualified candidates to fill open positions

45% U.S. employers say lack of skills is the “main reason” for entry-level vacancies

42% employers believe that recent graduates are ready for work

SKILLS GAP EXPLAINED

more vacant job positions

than qualified employees available

TOP 3 REASONS

47% lack technical skills

40% lack workplace competencies

36% lack of applicants

52% U.S. employers believe the talent shortage has a medium to high impact on the ability to meet client needs

RECOMMENDATIONS

• Educators must continually seek to tailor their programs to fit employer needs and emerging middle-skill job opportunities;

• Develop and expand infrastructure for internships, apprenticeships, and career technical education (CTE) programs in healthcare, IT, and advanced manufacturing;

• Develop comprehensive, adaptable middle-skill courses and certificate programs with transferable labor market skills;
OPPORTUNITIES

17,678 middle-skill job openings in OC per year over next decade

25% middle-skill job growth since 2003, faster than overall county employment growth

55% replacement positions

45% new positions

3.8% healthcare

3.9% Advanced Manufacturing

5.7% Information Technology

54% middle-skill occupations earn wages above Orange County’s estimated hourly living wage of $24.81

54% compared to 40% for all other OC occupations

21.3% OC residents aged 25+ have some college experience but no degree

7.8% Associates degrees

24.4% Bachelor’s degrees

13.5% Graduate degrees

34 of 50 fastest growing OC occupations in the next decade will require less than a 4-year degree

• Engage and partner with regional business community, economic development, and trade association organizations;

• Ongoing data-driven labor market analysis key to bridging the middle-skills gap; and

• Consider veterans first as key resources for middle-skill job openings, incentivize on-the-job training, and articulate “in-demand” middle-skills due to a high level of workplace ready skills possessed by returning veterans that are currently in high demand by employers.
Orange County’s middle-skill economy is largely driven by three prominent industries: healthcare, advanced manufacturing, and information technology (IT). Together these three industries amount to nearly one third of all middle-skill occupations and are the highest job growth industry clusters. Consequently, capitalizing on these three industries presents the greatest opportunity in addressing Orange County’s middle-skills gap.

**HEALTHCARE**

The healthcare sector has been a reliable generator of jobs in Orange County even during the Recession, growing from 96,400 jobs in 2000 (just under 7 percent of Orange County employment) to 175,000 jobs as of January 2016 (over 11 percent of Orange County employment). The industry creates job opportunities all along the education and experience spectrum, from entry-level to advanced professional occupations.

The industry’s recent transformation, caused by new technologies and the Affordable Care Act (ACA), will lead to new employment opportunities. Together, these two trends are transforming healthcare into a consumer-driven industry offering individualized services.
HEALTHCARE OCCUPATION ANALYSIS AND MIDDLE-SKILL ASSESSMENT

The healthcare industry employs a broad range of growing occupational categories, especially entry-level and middle-skill job opportunities. Nursing continues to be a bright spot for jobseekers in terms of projected employment growth and compensation, both for registered nurses (RNs) and licensed vocational nurses (LVNs). Medical assistants, dental assistants, dental hygienists, physical therapists, and medical/clinical laboratory technicians also exhibit strong growth.

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</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurses</td>
<td>18,280</td>
<td>$90,770</td>
<td>18,610</td>
<td>21,300</td>
<td>14.5%</td>
</tr>
<tr>
<td>Medical Assistants</td>
<td>7,340</td>
<td>$36,153</td>
<td>7,560</td>
<td>9,010</td>
<td>19.2%</td>
</tr>
<tr>
<td>Licensed Practical &amp; Licensed Vocational Nurses</td>
<td>6,380</td>
<td>$51,043</td>
<td>6,080</td>
<td>7,430</td>
<td>22.2%</td>
</tr>
<tr>
<td>Dental Assistants</td>
<td>5,270</td>
<td>$35,714</td>
<td>4,990</td>
<td>5,750</td>
<td>15.2%</td>
</tr>
<tr>
<td>Home Health Aides</td>
<td>3,420</td>
<td>$23,891</td>
<td>3,770</td>
<td>5,130</td>
<td>36.1%</td>
</tr>
<tr>
<td>Social &amp; Human Service Assistants</td>
<td>2,700</td>
<td>$32,853</td>
<td>2,380</td>
<td>2,940</td>
<td>23.5%</td>
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<tr>
<td>Dental Hygienists</td>
<td>2,300</td>
<td>$93,549</td>
<td>2,240</td>
<td>2,760</td>
<td>23.2%</td>
</tr>
<tr>
<td>Physical Therapists</td>
<td>2,090</td>
<td>$91,480</td>
<td>2,010</td>
<td>2,650</td>
<td>31.8%</td>
</tr>
<tr>
<td>Medical &amp; Clinical Laboratory Technicians</td>
<td>1,750</td>
<td>$42,627</td>
<td>1,580</td>
<td>2,150</td>
<td>36.1%</td>
</tr>
<tr>
<td>Health Technologists &amp; Technicians, Other*</td>
<td>1,290</td>
<td>$47,383</td>
<td>1,260</td>
<td>1,530</td>
<td>21.4%</td>
</tr>
</tbody>
</table>

*Includes Neurodiagnostic Technologists, Radiology Technicians, and Surgical Assistants

A recent report by Kaiser Permanente’s Jobs of the Future Committee – a group that collaborates with Vision 2025, Kaiser Permanente’s future workforce planning initiative, to predict the future of healthcare – describes the industry as providing a “new healthcare ‘shopping’ experience.” Kaiser Permanente predicts a new four-point continuum of care:
- Shift of care from hospital to home
- Transition from in-person to virtual care
- Remote monitoring, remote sensors, big data
- New patient care settings

A major part of the healthcare industry in the future, the report contends, will be coordination of a patient’s healthcare across this continuum. This sea change in the Healthcare industry will create employment opportunities, especially in the middle-skill category. The Jobs of the Future report identifies several key skills that will become integral to healthcare workers in the future: use of technology, critical thinking, assessment, and the ability to educate patients and navigate them through a wide variety of individualized healthcare services.

HEALTHCARE CAREER LADDER

ADVANCED
- Registered Nurse
- Physical Therapist

Middle-skill
- Licensed Vocational Nurse
- Medical Assistant
- Medical/Health/Lab Technician

ENTRY-LEVEL
- Certified Nursing Assistant
- Home Health Aide
MIDDLE-SKILL ASSESSMENT: HEALTHCARE

Of this report’s three industry sectors, the Healthcare industry exhibits the greatest opportunities for rapid employment growth, projected to increase by over 13,000 jobs in such occupational categories as RNs, LVNs, medical assistants, and dental assistants. Home health aides have the highest ratio of new jobs versus replacement jobs, indicating that growth will mostly stem from all-new positions instead of filling vacancies.

Job postings for registered nurses outweigh other middle-skill healthcare positions by roughly four to one, demonstrating demand as well as the financial value of nursing degrees. Occupations such as health technologists and technicians, medical assistants, and social and human service assistants are also in relatively high demand and provide excellent springboards for hands-on professional experience that can lead to careers in healthcare administration.

Figure 3.2: Orange County Healthcare Average Monthly Job Postings in 2015

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Average Online Job Postings per Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurses</td>
<td>1,611</td>
</tr>
<tr>
<td>Health Technologists &amp; Technicians</td>
<td>818</td>
</tr>
<tr>
<td>Medical Assistants</td>
<td>275</td>
</tr>
<tr>
<td>Social &amp; Human Service Assistants</td>
<td>274</td>
</tr>
<tr>
<td>Licensed Practical &amp; Vocational Nurses</td>
<td>235</td>
</tr>
<tr>
<td>Dental Assistants</td>
<td>194</td>
</tr>
<tr>
<td>Physical Therapists</td>
<td>146</td>
</tr>
<tr>
<td>Home Health Aides</td>
<td>103</td>
</tr>
<tr>
<td>Dental Hygienists</td>
<td>25</td>
</tr>
<tr>
<td>Medical &amp; Clinical Laboratory Technicians</td>
<td>24</td>
</tr>
</tbody>
</table>

Figures 3.3-3.6: Orange County Healthcare 2015 Job Posting Characteristics

- **Degree Required**
  - Less than Bachelor’s: 53.4%
  - Bachelor’s: 37.4%
  - Masters: 4.7%
  - Doctoral: 4%
- **Salary Level**
  - > $30,000: 7.7%
  - $31,000-$49,000: 32.3%
  - $50,000-$79,000: 20.7%
  - $80,000-$99,000: 23.7%
  - $100,000 +: 14.3%

Top 10 3-Digit SOC Occupations

- Oral and written communication skills
- Microsoft Office
- Detail oriented
- Customer service oriented
- Team oriented
- Problem solving
- Marketing
- Bilingual
- Integrity
- Time management

Top 10 Skills
Defining Career Pathways

As used in this report, the term “career pathways,” describes education and training programs that offer a well-articulated sequence of courses and work experiences that align with employer skill demands and lead to the completion of industry-valued “stackable credentials.” Stackable credentials offer students multiple clear entry and exit points for education and training as they progress toward an associates degree or the highest industry credential required for a specific occupation. This enables people to find jobs with increasing responsibility, knowing they can access additional short-term training as needed to move ahead. Career pathways can be particularly effective for launching young people and low-skill adults into good jobs because they can be designed to serve a range of populations and skill levels.

HEALTHCARE WORKFORCE OF THE FUTURE FOCUS GROUPS

Overall, the Healthcare industry is facing a significantly widening skills gap in Orange County due to a complex set of interrelated factors:

Major Overarching Skill/Talent Themes:

- Trends away from traditional inpatient, toward outpatient services, in-home care, and wellness are accelerating. Workforce training and talent needs to adapt to new decentralized realities of healthcare delivery;
- High demand for entry-level CNAs (certified nursing assistants), combined with low supply resulting in significant shortages;
- In order to meet industry targets which call for increasing the number of baccalaureate-prepared nurses in the workforce to 80% by 2020, BSN program capacity constraints need addressing;
- Growing demand for healthcare IT functions creating extreme shortages of healthcare IT workers, especially:
  - IT security
  - Coding/programming
  - Mobile app development
- Due to aging population demographic trends, employers are experiencing increased demand for healthcare professionals trained in geriatrics and the need for related specialized training programs;
- Pipeline/talent attraction/retention issues -- need for more clearly defined career paths/guidance for young healthcare professionals;
- Need to better understand the “millennial” mindset/preferences to improve attraction and retention of talented employees, especially regarding work/life balance;
- Cost of living, especially housing costs, are too high in region forcing a growing number of healthcare workers in healthcare employment clusters to live farther and farther away, resulting in longer commutes. Housing supply shortages and rising costs are a major issue for healthcare workforce in OC.
Information Technology Fast Facts

Information Technology’s (IT) high salaries and mix of high and low barrier-to-entry positions makes this industry cluster a significant source of future middle-skill jobs.

IT is a “cross-cutting” cluster which brings together multiple sectors to provide entry level and middle-skill employment opportunities across a wide variety of industries and workplace settings:

- Professional and business services
- Finance, insurance, real estate
- Healthcare
- Education
- Government
- Wholesale trade/logistics

IT-related occupations that intersect with healthcare, cybersecurity, and business analytics exhibit major employment growth.

IT CAREER LADDER

**ADVANCED**
- Network and Computer Systems/Database Administrator
- Computer Systems Analyst

**Middle-skill**
- Computer Network Support Specialist
- Java Developer
- Web Developer

**ENTRY-LEVEL**
- Computer User Support Specialist

CURRENT IT EMPLOYMENT IN ORANGE COUNTY

Although average salaries in IT industries have climbed in last year, overall employment has experienced little change since 2013. Employment growth in both the vertical and horizontal IT sectors will likely resume as economic growth and job creation picks up steam. Computer systems design features the highest employment growth (five percent) since 2013, with telecommunications featuring the highest salary growth over the same period. Software publishing is typically a bright spot for Orange County employment in IT and is projected to create a significant number of job opportunities in the next decade.
Best Practice: Regional Skills Collaborative: Orange County Information Technology Cluster Competitiveness Project

In 2013, the United States Department of Labor awarded a three-year, $3 million Workforce Innovation Fund grant to OCBC and the Orange County Workforce Investment Board for an initiative to address the skills gap in IT. The Orange County Information Technology Cluster Competitiveness Project brought together educational leaders and top executives from Orange County IT employers for a series of 16 facilitated strategic discussions over three years. These discussions lead to the development of efficient, effective IT training programs that supply business demand.

With a focus on long-term sustainability and fostering replication, the IT Competitiveness Project implemented a model that communities across the country can adopt wherever the IT cluster is a significant regional economic driver. This new approach to workforce planning brings together business and educational stakeholders to address short-, mid-, and long-term workforce supply needs.

Based upon these meetings, OCBC developed a roadmap that plots a course to address the needs of industries in which IT skills are a critical element to companies’ success. Using this roadmap, the county implemented several pilot initiatives that served over 250 participants, including:

1. Development of new IT training programs in conjunction with business demands, propelling Orange County to the forefront of IT education and training for emerging areas of new growth and job creation such as mobile application and development, healthcare IT, and IT security;

2. Re-tooling of existing IT programs and curricula to better reflect current and projected business-identified needs, building in a “business-nexus” to IT education and training to enrich jobseekers value in workplaces and the talent marketplace beyond mere technical skills to include enhanced soft skills and understanding of how IT can be a business driver; and

3. Development of an IT pipeline program, including a web-based internship portal as well as a targeted veterans initiative to ensure that better connections are made between IT students and jobseekers and employer’s short-term IT pipeline needs. Saddleback Community College’s well established Veterans’ Center was brought in to the partnership in order to provide specialized veterans’ services to support vets moving through the education and training.
Horizontal IT occupations, such as software development, user support specialists, and programmers, exhibit the industry’s highest growth. Although the EDD predicts information security analysts and web developers will be bright spots for employment growth through 2022, the industry’s current employment levels are slightly behind the pace set by the EDD’s predictions. Software developers, conversely, are already well on their way to exceeding 2022 employment expectations.

The California EDD’s labels for educational levels can be misleading because some IT-related certificates are nearly as valuable as more expensive, time-consuming bachelor’s degrees in the job market. In fact, IT employers’ hiring practices in general are a fairly good fit for middle-skill initiatives as they often favor certificate holders over bachelor’s holders; this encourages job seekers to pursue middle-skill certification training for positions such as Computer Systems Analysts.

In general, IT job openings come from new job openings rather than replacement needs. Systems analysts and software developers are occupations with high concentrations of new jobs generated over replacement needs, while computer programmers are more often replacement positions rather than newly created jobs.

IT and healthcare occupations typically rank near the top in terms of listings of job openings advertised online. The boom in job advertisements in 2014 and 2015 could stem from the rise of mobile devices and subsequent demand for mobile software development reflected in the high volume of job advertisements for software developers, applications. In general, horizontal IT jobs, such as web developers, experience the highest demand.

### Figure 4.1: Orange County Current and Projected Information Technology Occupation Growth

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<tbody>
<tr>
<td>Software Developers, Applications</td>
<td>9,360</td>
<td>$104,155</td>
<td>8,900</td>
<td>10,320</td>
<td>16.0%</td>
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<tr>
<td>Computer User Support Specialists</td>
<td>6,810</td>
<td>$57,472</td>
<td>6,330</td>
<td>7,920</td>
<td>25.1%</td>
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<tr>
<td>Software Developers, Systems Software</td>
<td>6,110</td>
<td>$121,626</td>
<td>6,900</td>
<td>8,220</td>
<td>19.1%</td>
</tr>
<tr>
<td>Computer Programmers</td>
<td>4,750</td>
<td>$82,933</td>
<td>5,060</td>
<td>5,810</td>
<td>14.8%</td>
</tr>
<tr>
<td>Computer Systems Analysts</td>
<td>4,700</td>
<td>$90,334</td>
<td>4,970</td>
<td>6,500</td>
<td>30.8%</td>
</tr>
<tr>
<td>Network and Computer Systems Administrators</td>
<td>4,540</td>
<td>$89,351</td>
<td>4,340</td>
<td>5,270</td>
<td>21.4%</td>
</tr>
<tr>
<td>Computer Network Support Specialists</td>
<td>1,860</td>
<td>$69,487</td>
<td>1,870</td>
<td>1,970</td>
<td>5.3%</td>
</tr>
<tr>
<td>Web Developers</td>
<td>1,830</td>
<td>$72,874</td>
<td>2,090</td>
<td>2,840</td>
<td>35.9%</td>
</tr>
<tr>
<td>Computer Network Architects</td>
<td>1,530</td>
<td>$115,227</td>
<td>1,430</td>
<td>1,840</td>
<td>28.7%</td>
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<td>Database Administrators</td>
<td>1,440</td>
<td>$89,736</td>
<td>1,250</td>
<td>1,570</td>
<td>25.6%</td>
</tr>
<tr>
<td>Information Security Analysts</td>
<td>590</td>
<td>$104,155</td>
<td>460</td>
<td>660</td>
<td>43.5%</td>
</tr>
<tr>
<td>Computer and Information Research Scientists</td>
<td>360</td>
<td>$122,832</td>
<td>710</td>
<td>860</td>
<td>21.1%</td>
</tr>
</tbody>
</table>

Source: California EDD, OES Dataset

### MIDDLE-SKILL ASSESSMENT: INFORMATION TECHNOLOGY

The California EDD’s labels for educational levels can be misleading because some IT-related certificates are nearly as valuable as more expensive, time-consuming bachelor’s degrees in the job market. In fact, IT employers’ hiring practices in general are a fairly good fit for middle-skill initiatives as they often favor certificate holders over bachelor’s holders; this encourages job seekers to pursue middle-skill certification training for positions such as Computer Systems Analysts.

In general, IT job openings come from new job openings rather than replacement needs. Systems analysts and software developers are occupations with high concentrations of new jobs generated over replacement needs, while computer programmers are more often replacement positions rather than newly created jobs.

IT and healthcare occupations typically rank near the top in terms of listings of job openings advertised online. The boom in job advertisements in 2014 and 2015 could stem from the rise of mobile devices and subsequent demand for mobile software development reflected in the high volume of job advertisements for software developers, applications. In general, horizontal IT jobs, such as web developers, experience the highest demand.

### Figure 4.2: Orange County IT Average Monthly Job Postings in 2015

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Average Online Job Postings per Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Developers, Applications</td>
<td>1,024</td>
</tr>
<tr>
<td>Web Developers</td>
<td>935</td>
</tr>
<tr>
<td>Computer Systems Analysts</td>
<td>904</td>
</tr>
<tr>
<td>Computer User Support Specialists</td>
<td>774</td>
</tr>
<tr>
<td>Network &amp; Computer Systems Administrators</td>
<td>611</td>
</tr>
<tr>
<td>Computer Programmers</td>
<td>359</td>
</tr>
<tr>
<td>Database Administrators</td>
<td>206</td>
</tr>
<tr>
<td>Information Security Analysts</td>
<td>166</td>
</tr>
<tr>
<td>Software Developers, Systems</td>
<td>156</td>
</tr>
<tr>
<td>Computer Network Architects</td>
<td>62</td>
</tr>
<tr>
<td>Computer and Information Research Scientists</td>
<td>18</td>
</tr>
</tbody>
</table>

Source: The Conference Board, HWOL Dataset
INFORMATION TECHNOLOGY WORKFORCE
OF THE FUTURE FOCUS GROUPS

The main issues highlighted by this focus group shared some similarities with those raised by our healthcare focus group, while introducing new issues specific to IT, including:

Major Overarching Skill/Talent Themes:

- Many recent university graduates look for cool startups and large, well-known tech companies, but ignore the vast majority of non-tech companies that also have growing IT needs such as healthcare, financial institutions, etc.
- Many applicants have technical skills but lack soft skills, which are necessary for efficient and successful project and team management. Additionally, there are some non-technical hard skills that are in demand that need to be taught, including project management and business analytics.
- Sales is also an overlooked skill that is essential to many entry-level jobs.
- Applicants lack specialized skills for new and emerging technologies, skills and knowledge need to evolve at the same pace as technologies. Current “in-demand” skills that are in low supply:
  - Cybersecurity
  - Robotics – how to apply data to business and entrepreneurial questions
  - Mobile development
- In the IT world, for certain occupations, professional certifications are just as important, if not more important, than four-year degrees.
- Bachelor’s degrees are still important – it shows a level of persistence, and degrees impart powerful skills like problem-solving, although the technical skills learned in college are less important. The lack of focus on soft skills in colleges and universities is a problem for employers.
- Orange County’s high cost of living limits employer recruiting and retention abilities, especially hurting entry-level hiring because most applicants simply cannot afford to live in the area.
Advanced Manufacturing

Manufacturing employment declines have been less severe in Orange County than the nation over the last few decades. In fact, overall manufacturing wages in Orange County have increased significantly.

New job creation can, at first glance, appear limited in the sector, but measurement masks a significant amount of good-paying middle-skill job opportunities emerging due to retirement of an aging manufacturing workforce.

Manufacturing growth is highly concentrated in industry clusters that Orange County has built a sustainable competitive advantage in over time:

- Medical device, equipment, and supplies
- Computer and electronic products
- Aerospace products and parts
- Printing and related
- Fabricated metal products
- Pharmaceuticals and medicine

Advanced manufacturing requires a highly skilled, productive workforce to thrive in Orange County. Occupations include various engineering and supervisorial professions at the advanced level and assemblers or machine operators at entry level.

Advanced Manufacturing

Manufacturing is making a comeback in Orange County. In fact, the county currently has well over 160,000 manufacturing jobs as well as indicators of accelerating job growth in this sector. Onshoring, or the return of U.S. manufacturing from abroad, is rapidly gaining momentum due to low energy prices, manufacturing efficiencies and productivity gains, and the desire to make supply chains more efficient. This unfolding American industrial renaissance could well develop into the most important driver of economic growth, higher wages, greater consumer spending, and rising standards of living. The question of whether Orange County will indeed capture its fair share of growth in the manufacturing sector, especially in advanced manufacturing, likely revolves around developing the necessary workforce talent amongst students and job seekers coming up through the education and workforce training system needed to replace retiring baby boomer talent.

Advanced manufacturing includes businesses that typically produce high-tech products such as computer components, advanced electronics, nanotech, and advanced materials, as well as companies that use advanced, usually automated manufacturing processes to produce a wide variety of traditional consumer products from clothes to food products. In other words, Advanced manufacturing is defined more by the efficiency and integration of its production processes rather than the use of emerging technologies. While 55 percent of Orange County manufacturers make scientific or high-tech products, almost all Orange County manufacturers use advanced manufacturing techniques. Advanced Manufacturing requires a highly skilled, productive workforce to thrive in Orange County. Occupations include various engineering and supervisorial professions at the advanced level and assemblers or machine operators at entry level.

ADVANCED MANUFACTURING CAREER LADDER

**ADVANCED**
- Industrial Production Manager

**Middle-skill**
- Machinist
- First-line Production Supervisor

**ENTRY-LEVEL**
- Electronic/Electromechanical Equipment Assembler
- Welder
- Inspectors/Testers

While 55 percent of Orange County manufacturers make scientific or high-tech products, almost all Orange County manufacturers use advanced manufacturing techniques. Advanced manufacturing requires a highly skilled, productive workforce to thrive in Orange County. Occupations include various engineering and supervisorial professions at the advanced level and assemblers or machine operators at entry level.
The Coming Skills Gap in Advanced Manufacturing

Several recent reports at the national level delineate the growing manufacturing skills shortage. In a recent report titled “Combating the Skills Shortage in U.S. Manufacturing”, Accenture reports that U.S. manufacturers are losing up to 11 percent of net earnings annually as a result of a shortage of skilled workers leading to increased production costs, with 80 percent of executives reporting a moderate to severe shortage of highly-skilled production workers.

Additionally, The Manufacturing Institute and Deloitte Consulting recently released “The Skills Gap in U.S. Manufacturing: 2015 and Beyond”, a report which highlighted the widening skills gap at the national level.

“Over the next decade, nearly three and a half million manufacturing jobs likely need to be filled and the skills gap is expected to result in 2 million of those jobs going unfilled. There are two major contributing factors to the widening gap – baby boomer retirements and economic expansion. An estimated 2.7 million jobs are likely to be needed as a result of retirements of the existing workforce, while 700,000 jobs are likely to be created due to natural business growth.”

The report cites additional factors that are contributing to the shortage of skilled manufacturing workers, including a lack of STEM skills and young peoples’ often negative image of manufacturing.

With 60 percent of open positions going unfilled due to a manufacturing talent shortage, 80 percent of manufacturing executives surveyed reported they are willing to pay more than market rates for key unfilled occupations.
The occupations most closely aligned with middle-skill requirements in advanced manufacturing are specialized equipment assemblers, machinists, and front-line supervisors, categories that exceed the California EDD’s job growth expectations. Machinists are particularly important to Advanced manufacturing growth thanks to their broad application of services and relatively high salary growth compared to training requirements.

Several thousand new manufacturing workers will be needed each year to replace retiring workers, a development that offers entry-level Advanced manufacturing jobs with upward mobility to higher-paying positions.

Figure 5.1: Orange County Current & Projected Advanced Manufacturing Occupation Growth

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Laborers and Freight, Stock, and Material Movers</td>
<td>24,250</td>
<td>$26,159</td>
<td>22,070</td>
<td>26,990</td>
<td>22.3%</td>
</tr>
<tr>
<td>Team Assemblers</td>
<td>17,060</td>
<td>$28,377</td>
<td>12,650</td>
<td>12,300</td>
<td>-2.8%</td>
</tr>
<tr>
<td>Packers and Packagers</td>
<td>9,240</td>
<td>$22,957</td>
<td>9,450</td>
<td>10,660</td>
<td>12.8%</td>
</tr>
<tr>
<td>Inspectors, Testers, Sorters, Samplers, and Weighers</td>
<td>7,180</td>
<td>$40,225</td>
<td>7,010</td>
<td>7,290</td>
<td>4.0%</td>
</tr>
<tr>
<td>Helpers--Production Workers</td>
<td>6,660</td>
<td>$25,425</td>
<td>5,410</td>
<td>5,830</td>
<td>7.8%</td>
</tr>
<tr>
<td>First-Line Supervisors of Production and Operating Workers</td>
<td>6,310</td>
<td>$58,372</td>
<td>6,570</td>
<td>6,640</td>
<td>1.1%</td>
</tr>
<tr>
<td>Electrical and Electronic Equipment Assemblers</td>
<td>6,090</td>
<td>$26,901</td>
<td>4,780</td>
<td>4,640</td>
<td>-2.9%</td>
</tr>
<tr>
<td>Machinists</td>
<td>6,050</td>
<td>$42,108</td>
<td>5,950</td>
<td>6,880</td>
<td>15.6%</td>
</tr>
<tr>
<td>Electromechanical Equipment Assemblers</td>
<td>930</td>
<td>$31,624</td>
<td>1,200</td>
<td>1,100</td>
<td>-8.3%</td>
</tr>
<tr>
<td>Semiconductor Processors</td>
<td>700</td>
<td>$35,522</td>
<td>760</td>
<td>600</td>
<td>-21.1%</td>
</tr>
</tbody>
</table>

Source: California EDD, OES Dataset
MIDDLE-SKILL ASSESSMENT: ADVANCED MANUFACTURING

On the surface, middle-skills job opportunities in manufacturing can appear to be difficult to identify. Most of the industry cluster’s jobs are either low-paid entry-level positions or engineering positions that require a bachelor’s degree. Job change in manufacturing is dominated by retirement-driven replacement needs instead of new openings.

However, several thousand new manufacturing workers will be needed each year to replace retiring workers, a development that offers entry-level Advanced manufacturing jobs with upward mobility to higher-paying positions. As a result, more advanced labor market analytics were employed to uncover where middle-skill job growth will take place in the future. Occupations such as inspectors and machinists, on the other hand, offer relatively high rates of job growth with a large percentage of new job openings over replacements.

Additional middle-skill job opportunities in advanced manufacturing workplaces involve occupations that are not production-related, but are classified under other occupational categories such as logistics, sales/marketing, customer service, and general business operations. EDD research found that California manufacturers require more experience and higher levels of formal education for skilled production workers than the national average; increasing demand for middle-skill manufacturing workers. The EDD also found that around one fourth of California job posts are for manufacturing-related positions.

### Figure 5.2: Advanced Manufacturing Occupations Exhibiting Skills Shortages

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Skills Shortage Today (% of Companies)</th>
<th>Skills Shortage by 2020 (% of Companies)</th>
<th>Average Time to Fill Open Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled Production Workers</td>
<td>54%</td>
<td>63%</td>
<td>70 days</td>
</tr>
<tr>
<td>Engineers</td>
<td>33%</td>
<td>48%</td>
<td>94 days</td>
</tr>
<tr>
<td>Research Scientists</td>
<td>28%</td>
<td>37%</td>
<td>94 days</td>
</tr>
</tbody>
</table>

*Source: The Manufacturing Institute / Deloitte Consulting*

### Figure 5.3: Orange County Advanced Manufacturing

Average Monthly Job Postings in 2015

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Average Online Job Postings per Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Engineers</td>
<td>726</td>
</tr>
<tr>
<td>First-Line Supervisors of Production and Operating Workers</td>
<td>418</td>
</tr>
<tr>
<td>Laborers and Freight, Stock, and Material Movers, Hand</td>
<td>178</td>
</tr>
<tr>
<td>Electronics Engineers, Except Computer</td>
<td>168</td>
</tr>
<tr>
<td>Inspectors, Testers, Sorters, Samplers, and Weighers</td>
<td>121</td>
</tr>
<tr>
<td>Machinists</td>
<td>100</td>
</tr>
<tr>
<td>Helpers--Production Workers</td>
<td>86</td>
</tr>
<tr>
<td>Electrical and Electronic Equipment Assemblers</td>
<td>63</td>
</tr>
<tr>
<td>Chemists</td>
<td>31</td>
</tr>
<tr>
<td>Team Assemblers</td>
<td>31</td>
</tr>
<tr>
<td>Packers and Packagers, Hand</td>
<td>22</td>
</tr>
<tr>
<td>Electromechanical Equipment Assemblers</td>
<td>22</td>
</tr>
</tbody>
</table>

*Source: The Conference Board, HWOL Dataset*
As previously highlighted, Advanced manufacturing employment in Orange County is comprised of a vibrant, diverse set of primarily high-tech or tech-related industry sub-sectors such as medical device, defense/aerospace, and computer/advanced electronics. Figure 5.9 shows the diverse industry mix of the top Orange County Advanced Manufacturing sub-sectors in which job openings were posted in 2015.

### Top 10 Advanced Manufacturing Industry Sub-Sectors with most 2015 Job Openings in Orange County

<table>
<thead>
<tr>
<th>Sub-Sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical and Medical Instrument Manufacturing</td>
<td>11%</td>
</tr>
<tr>
<td>Semiconductor and Related Device Manufacturing</td>
<td>10%</td>
</tr>
<tr>
<td>Surgical Appliance and Supplies Manufacturing</td>
<td>6%</td>
</tr>
<tr>
<td>Aircraft Manufacturing</td>
<td>6%</td>
</tr>
<tr>
<td>Other Aircraft Parts and Auxiliary Equipment Manufacturing</td>
<td>5%</td>
</tr>
<tr>
<td>Computer Terminal and Other Computer Peripheral Equipment Manufacturing</td>
<td>5%</td>
</tr>
<tr>
<td>Ophthalmic Goods Manufacturing</td>
<td>4%</td>
</tr>
<tr>
<td>Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing</td>
<td>4%</td>
</tr>
<tr>
<td>Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing</td>
<td>4%</td>
</tr>
<tr>
<td>Aircraft Engine and Engine Parts Manufacturing</td>
<td>3%</td>
</tr>
</tbody>
</table>

1/4 of California job posts are for manufacturing-related positions.
ADVANCED MANUFACTURING WORKFORCE OF THE FUTURE FOCUS GROUPS

The primary issues raised by this focus group included a unique set of opportunities and challenges specific to the manufacturing sector, including the industry’s public image and the ramifications of robotics, artificial intelligence, and automation.

Major Overarching Skill/Talent Themes:

- There are many good-paying, middle-skill jobs in manufacturing that are accessible to workers without a four-year degree.
- However, manufacturing has an image problem, with many potential workers reporting a general disinterest in manufacturing due to misconceptions about the industry and workplace. Even many career advisement/counseling professionals disregard opportunities in manufacturing for the most part.
- Due to a predominantly boomer workforce reaching retirement age, manufacturing faces a cliff in terms of a shortage of workforce talent. Steps need to be taken now to make the sector attractive again by showcasing both the wage and career advancement opportunities.
- In a parallel and perhaps related trend, institutions of higher education have eliminated many programs geared towards training young people with the skills required in manufacturing jobs.
- As a result, applicants currently lack soft, technical, and critical thinking skills such as teamwork, process improvement and problem solving, quality control, and certain specialized computer-based skills required in being able to adapt and adopt new and emerging technologies.
- There needs to be a concerted effort in creating more and better partnerships between education, industry associations and employers in order to properly inform and develop a new workforce pipeline for the future.
Veterans in Orange County represent a significant untapped talent pool that could help close Orange County’s middle-skill employment gap. Unfortunately, Orange County’s veteran population – the third highest in California – faces major challenges in adjusting to civilian life, especially to the civilian job market. Post-9/11 Orange County veterans are three times more likely to be unemployed than civilians and almost three times more likely to live under the poverty line, both problems in a county with an extremely high cost of living.

Middle-skill job opportunities could provide a solution to the unemployment problems that veterans face in Orange County. More than half of the county’s post-9/11 veterans have educational backgrounds that fall under the middle-skills category. The USC School of Social Work’s “The State of the American Veteran: the Orange County Veterans Study” reports that 36 percent of veterans attended some college, 15 percent hold an associates degree and approximately 3 percent hold a trade certificate. In addition to their formal education, veterans also bring leadership and technical skills that make them stand out in the workplace.

As the USC School of Social Work’s study recommends, Orange County needs “innovative employment strategies” to help its returning veterans become fully active in the workforce. Below, opportunities for veteran employment are highlighted in each of the three middle-skill sectors along with specific recommendations for increasing veteran engagement in these areas.
VETERAN EMPLOYMENT AND OPPORTUNITIES IN HEALTHCARE

The most recent U.S. Census estimates that only 46,971 of Orange County’s 127,136 veterans are currently in the labor force; veterans in the labor force face a 9.6 percent unemployment rate. While many middle-skill healthcare jobs are good fits for veterans, medical records and health information technicians provide especially veteran-friendly job opportunities. This occupation, estimated to grow by nearly 21 percent by 2022, offers an annual average salary of $41,389.

VETERAN EMPLOYMENT AND OPPORTUNITIES IN INFORMATION TECH

Military veterans are an ideal fit for IT work with their discipline, dedication and technical experience. Active military and veterans, who possess many of the skills required for a career in IT, could become successful IT workers with help from support services, education, and employers who recognize their skills and experience. With inherent aptitude for systems, software, and service, veterans will find abundant opportunities for a good employment fit in database administration, software programming, and the emerging field of healthcare information technicians.

The Information technology industry provides numerous lucrative opportunities for veterans in Orange County; Software developers, for example, are estimated to add 1,320 jobs between 2012 and 2022 for a 19.1 percent increase. This veteran-friendly occupation earns average annual wages of $112,472, much higher than local and national averages. Computer support specialist occupations, who had similar job growth – 1,590 jobs – over the same period, earn a much lower average salary of $56,009.

Additionally, computer system analysts and network and computer systems administrators occupations are expected to grow by 1,530 and 930 jobs, respectively between 2012 and 2022, while providing annual average earnings of $89,456 and $84,701, respectively. This combination of high salaries and occupational growth means that the information technology industry is positioned to greatly help Orange County’s veteran population.

VETERAN EMPLOYMENT AND OPPORTUNITY IN ADVANCED MANUFACTURING

Orange County veterans with backgrounds in logistics should consider advanced manufacturing as potential field of employment. Army supplymen and logistics specialists are knowledgeable in computing technologies and how they apply to directing others and clearly communicating complex problems. Production oversight jobs in manufacturing, such as the growing field of industrial production managers, are an ideal fit for their talents, but their business-centric organization skills also enable success as secretaries and administration assistants for executive clients.
Goodwill of Orange County’s Enduring Independence Veterans Initiative

Launched in 2013, Goodwill’s Enduring Independence Veterans’ program collaborates with community agencies to promote the stability and wellbeing of veterans, a mission illustrated by its Santa Ana fitness and rehabilitation center that provides free services to disabled veterans. In addition, the program also provides a referral service that connects veterans to resources such as healthcare, mental health providers, and housing as well as a Transition Readiness Seminar (TRS) for returning veterans at Camp Pendleton.

Enduring Independence also addresses the unemployment problem that many veterans face through its partnerships with major Orange County employers such as Disney, Nike, Hurley, Hoag Hospital and Chevron as well as non-profits such as AmeriCorps and the Orange County Veterans and Military Families Collaborative. The program hosts military-oriented job fairs in collaboration with the EDD, U.S. Chamber of Commerce, and OC One-Stop Centers.

Finally, Enduring Independence addresses the higher education of veterans – a need identified by 43 percent of post-9/11 veterans – through partnerships with California State University, Fullerton and Coastline, Saddleback, and Santa Ana community colleges. Enduring Independence estimates that, by the end of 2015, it will have served approximately 7,000 veterans and hopes to enroll 6,000 more in 2016.
Saddleback College’s Commitment to Veterans

Saddleback College provides a number of programs and services created specifically to serve their Veteran students including their VetSuccess on Campus initiative and their Veterans IT Pipeline Initiative. The VetSuccess on Campus program, through a liaison with the Department of Veterans Affairs, assists veterans in identifying career goals, employment opportunities, provides support counseling, resources for veteran benefits and various other referral services. These services help to bring down barriers faced by veterans in both the academic and employment landscapes, ensuring they are able to properly adjust to civilian life. Saddleback College also provides a course titled “Boots to Books” which provides an emphasis on transitioning combat warriors into college and civilian communities.

The Veterans IT Pipeline Initiative provides veterans with career counseling, academic planning, job training, internships and job placement opportunities in technology or information technology industries. This extremely valuable program not only connects veterans with potentially lucrative employment opportunities but also serves to close Orange County’s widening skills gap. Veterans, especially those who worked in support operations while deployed, have a unique advantage due to their experience with IT products and initiatives providing a solid base on which to further build their skills for application into civilian IT-related occupations.
Although Orange County continues to recover from the Great Recession, the skills gap threatens the county’s future economic growth and prosperity. Orange County has great potential to continue to grow middle-skill occupations, especially in the healthcare, information technology and advanced manufacturing sectors outlined in this report. However, demand for middle-skill occupations created by employers has often gone unfulfilled due to limited understanding of this growing opportunity and limited availability of middle-skill credentials.

By closing the skills gap identified in this report, the Orange County education and workforce development community can pave the way for post-Recession success by filling these “in demand” middle-skill positions in healthcare, IT, and advanced manufacturing. Cluster-specific education and workforce training preparation will provide employers with a qualified local workforce to fill these positions. These occupations in turn both promote economic activity within the region and provide improved employment opportunities for jobseekers.

Veterans are an ideal fit for many middle-skill occupations; employers could also directly benefit from greater inclusion of veterans in these occupations. Providing veterans with access to middle-skill job training would both supply employers with a strong talent pool and ease veterans’ transition into civilian life. Establishing new programs designed to facilitate veteran participation in middle-skill initiatives can set Orange County apart and create a new source of workforce talent.
RECOMMENDATIONS

OPPORTUNITY CREATING JOB GROWTH BY UNDERSTANDING KEY ECONOMIC AND WORKFORCE DRIVERS
Economic development and workforce experts almost unanimously agree on the need for industry-driven, sector-focused workforce development strategies that track with economic development priorities. Using detailed information on current and projected workforce demand provided by the private sector, regions can work to set appropriate targets, align funding and programming, and encourage cross-sector collaboration on the development and implementation of educational and workforce training initiatives that support economic development.

EMPLOYERS ARTICULATE “IN DEMAND” MIDDLE-SKILLS
Educators must continually seek to tailor their programs to fit employer needs and emerging job opportunities. Often, employers, educational institutions, and workforce professionals have not effectively communicated their needs to middle-skill education and training programs; Orange County institutions need employer guidance to align their learning outcomes with job market demand.

EMPLOYERS INCENTIVIZE ON-THE-JOB TRAINING
Most middle-skill occupations require technical expertise that can be improved through on-the-job training. This makes middle-skill occupations very conducive to employer-led job training, which can have major benefits for employers, employees, and educators. Employer-led training is key factor in successfully addressing the skills gap.

EDUCATORS AND WORKFORCE PROFESSIONALS ONGOING DATA-DRIVEN LABOR MARKET ANALYSIS KEY TO BRIDGING THE MIDDLE-SKILLS GAP
In an increasingly complex labor market driven by technology and global trends, a lack of knowledge and information about labor market trends stands in the way of many young adults finding their best industry/occupational “fit” for their skills, knowledge, and abilities. Many current education and workforce training programs do not “fit” with current and projected employment trends. Ongoing development of advanced labor market analytics will lead to data-supported training programs that will produce better results for both young adults and stakeholders.

EDUCATORS AND WORKFORCE PROFESSIONALS ENGAGE AND PARTNER WITH BUSINESS ORGANIZATIONS
After reviewing manufacturing education and training programs around the nation, The Manufacturing Institute found that the most successful efforts were employer-driven and typically galvanized and led by business associations, the most effective champions in engaging employers.

EDUCATORS DEVELOP COMPREHENSIVE, ADAPTABLE MIDDLE-SKILL COURSES AND CERTIFICATE PROGRAMS WITH TRANSFERABLE SKILLS
The time required to design higher-ed curriculum means that courses focusing on IT and other technical subjects may already be outdated by the time they appear in course catalogs. New courses IT and technical curriculum designed by educators must have some built-in adaptability to evolve so that they stay relevant.

EDUCATORS PLANT INTEREST EARLY
Although K-12 education is outside the direct scope of this report, the pre-college years are critical determinants of success for students and provide opportunities to guide students to middle-skill career pathways. Community colleges, ROPs, and certificate programs, however, remain the key resources for generating well-trained middle-skill workers.

EDUCATORS AND WORKFORCE PROFESSIONALS DEVELOP EXPANDED INFRASTRUCTURE FOR INTERNSHIPS, APPRENTICESHIPS, AND CAREER TECHNICAL EDUCATION (CTE) PROGRAMS
Improving the amount and quality of CTE internship and apprenticeships, strong early work experience, and other models of work-based learning will pay substantial dividends. Evidence has shown that high-quality CTE can have a strong, positive impact on worker earnings as much as eight years after enrollment.

EMPLOYERS AND EDUCATORS CONSIDER VETERANS FIRST
“Corporate leadership, veteran-specific training and a long-term commitment to veterans’ employment were all significant factors in diminishing barriers to veteran employment and reintegration.” - Institute for Veterans and Military Families: Syracuse University, 2013