Leadership Academy Team Project Report

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Project Title: Enhancing Career Education for Cloud-Based Industries

Executive Summary

Team Cloud 9 proposes creating a Career Technical Education (CTE) program for Cloud-Based industries in Ventura County. Such a program would train students with the skills necessary to succeed in the fast growing cloud computing industry. Cloud-Based industries are those employers that use applications, resources, or services that are on demand via the internet from a cloud computing service provider's servers. These can be companies with storefronts or not; they use the cloud to maintain their data instead of managing and caring for servers at their place of operation. As a result, there is a demand for jobs to maintain such cloud-based services.

Part of the goal of this project is to develop the infrastructure at Moorpark College for their existing cloud-based and cybersecurity courses and facilities. Doing so will help to edify not only Moorpark College, but the district as well, by creating a state-of-the art program that all three campuses can build upon and develop. This can become an expanded districtwide collaborative program where each campus participates and uses existing faculty before seeking new faculty to build their own cloud-based program.

An auxiliary part of the goal is to offer the training online via Canvas or the Amazon Web Services (AWS) Educate template already implemented by Los Angeles Community College District (LACCD) and available to other California Community Colleges (CCC). The AWS Educate template is a cloud computing education template developed by LACCD in conjunction with Amazon Web Services to meet the skills need of cloud computing jobs. The third part of this goal is to use Open Educational Resources (OER), where possible, to allow for updates and tailoring to the needs of the curriculum developed.

Team Cloud 9 has learned about the industry by reaching out to area employers to understand their business interests in hiring candidates who have earned a cloud-based computing certificate or degree. We worked with Moorpark College to understand their needs and help them develop the program so that Oxnard and Ventura Colleges can develop similar programs to serve the needs of their communities.

As a result of our work, the proposed program provides students with industry standard skills to understand and develop applications for the cloud. Students learn a range of topics that cover technical principles of the hardware and software requirements to run systems on the cloud, including storage, database management and software systems, while maintaining secure access. To achieve a certificate, students must complete fifteen units with minimum grades of C or better. There is potential to develop a degree in this area as well.

Cloud technology is continuing to develop and is in demand both by the public and private market sectors. Cloud computing is now a core competency sought by the computer software industry. By developing the existing program at Moorpark college and expanding this to all campuses in the district, the Ventura County Community College District (VCCCD), can create intern and externships with local businesses, such as Nuance in Agoura, who are willing to offer industry tours and presentations to enhance the learning outcomes and promote student success; however, they inquired about job coaching/training and how they might be involved. As far as internships and job placements, Nuance requires a four-year degree program as the minimum qualification. Creating a certificate program with the potential to be developed into an associate degree for transfer at the colleges in the VCCCD will also enable students to seek such an AA-T in our district and transfer to universities in order to earn a BA for companies, such as Nuance.

Nuance is just the beginning. Interest from other local businesses begins to foster employment opportunities thus supporting our local economies. This means high salary jobs for VCCCD graduates of the program in Ventura County. Currently, there is a local shortage of qualified cloud-trained employable workers. A cloud-based program would have appeal as it offers a solid pathway to a good career.

Introduction

Mission:

To provide VCCCD's diverse student body with the key skills needed to secure a job in the (local) technology industry.

Objectives:

- Research Moorpark College's existing program to expand upon it so that all three colleges may have their own similar programs.
- Contact local companies and other businesses to collaborate on internships, such as Nuance as previously mentioned in the Executive Summary.
- Team-up with Amazon Web Services (AWS) Educate, which provides students and educators with the resources needed to accelerate cloud-related learning.

Committees/Work Groups:

- Moorpark College:
  - Curriculum Committee
  - Distance Education Committee
  - Student Success and Equity Committee

- **Oxnard College:**
  - Curriculum Committee
  - Distance Education Committee
  - Student Success Committee
  - Program Effectiveness and Planning Committee

- **Ventura College:**
  - Curriculum Committee
  - College Planning Committee
  - Distance Education Committee
  - Student Success Committee

- **District Committees:**
  - Districtwide Distance Education Advisory Committee
  - Instructional Technology Committee

Brief Statements:

We believe that by providing Moorpark College, and by extension Oxnard and Ventura Colleges, and their surrounding communities with the opportunity to earn a cloud-based computing certificate, the potential to improve one's earning potential will increase. Additionally, we believe that this creates opportunities for secure employment, enhanced job opportunities, and an educated, specialized yet in-demand profession.

Project Philosophy:

Our philosophy is to prepare learners with diverse backgrounds and experiences for gainful employment and lifelong learning opportunities. Via a proactive mentality and a flexible, practical approach, it provides technical and academic skills for students who seek career success, playing a foundational role in the overall betterment of our local society and economy.

Background

Currently, businesses are moving towards cloud-based systems to store data and run their businesses, triggering the demand for a workforce to maintain and develop the growth of cloud technologies, and there are simply not enough qualified workers to employ.

The demand for delivery of cloud-based computer power, database storage, applications, and other Information Technology (IT) resources through cloud service platforms via the internet is increasing. Options like pay-as-you-go pricing make such services available to a vast demographic from large organizations to small or home-run businesses. Whether a business is running applications that share photos to millions of mobile users or a small business supporting its critical operations, a cloud services platform provides rapid access to flexible and low-cost IT resources. Cloud computing services do not require large upfront investments in hardware that require time to install, learn, and maintain. Instead, those using cloud technologies can provision exactly the right type and size of computing resources needed to power the newest bright idea or operate an IT department. Users of cloud-based technologies can access as many resources as they need, almost instantly, and only pay for what is used or needed.

How Does Cloud Computing Work?

Cloud computing provides a simple way to access servers, storage, databases and a broad set of application services over the Internet. A cloud services platform, such as Amazon Web Services (AWS), owns and maintains the network-connected hardware required for these application services, while those who use such technologies provision and use what they need via a web application. Cloud computing is providing developers and IT departments with the ability to focus on what matters most and avoid undifferentiated work, like procurement, maintenance, and capacity planning. As cloud computing has grown in popularity, several different models and deployment strategies have emerged to help meet the specific needs of different users. Each type of cloud service and deployment method provides different levels of control and flexibility of the services that may be needed or used. Understanding the differences between Infrastructure as a Service (IAAS), Platform as a Service (PAAS), and Software as a Service (SAAS), as well as what deployment strategies can be used, can help users decide what set of services is right and for which needs the service or services apply. The AWS Cloud provides a broad set of infrastructure services, such as computing power, storage options, networking and databases, delivered as a utility: on-demand, available in seconds, with pay-as-you-go pricing.

Current Demands and Salary Projections

Current world technology demands a cloud trained workforce to maintain developed technologies. Demand for cloud computing expertise continues to increase exponentially and will accelerate in 2019. According to a 2018 Forbes article entitled "Where the Could Computing will be in 2019," the median salary for cloud computing professionals in 2018 was $146,250. According to the article mentioned above, cloud computing salaries soared in the last two years, with 2016's median salary being $124,300 a jump of $22,050.

The Hiring Scale is 78 for jobs that require cloud computing skill sets, with the average job post staying open 46 days. The higher the Hiring Scale score, the more difficult it is for employers to find the right applicants for open positions.

There are 50,248 cloud computing positions available in the United States today from 3,701 employers and 101,913 open positions worldwide today. Java, Linux, Amazon Web Services (AWS), Software Development, DevOps, Docker and Infrastructure as a Service (IaaS) are the most in-demand skills. Washington DC, Arlington-Alexandria, VA, San Francisco-Oakland-Hayward, CA, New York-Newark-Jersey City, NY, San Jose-Sunnyvale-Santa Clara, CA, Chicago-Naperville-Elgin, IL, are the top five cities where cloud computing jobs are today and will be in 2019. **Oracle (NYSE: ORCL), Deloitte and Amazon (NASDAQ: AMZN) have the most open cloud computing jobs today.** IBM, VMWare, Capital One, Microsoft, KPMG, Salesforce, PricewaterhouseCoopers, U.S. Bank, and Booz Allen Hamilton, Raytheon Corporation, SAP,

Capgemini, Google, Leidos and Nutanix all have over 100 open cloud computing positions today. (Where Cloud Computing Jobs will be in 2019, Forbes Nov. 27 2018)

Indeed.com, a job board, lists the following as the most in-demand job openings that seek cloud-related skills:

1. Software engineer
2. Senior software engineer
3. Software architect
4. Development operations engineer
5. Full stack developer
6. Cloud engineer
7. Data engineer
8. Java developer
9. System engineer
10. Data scientist
11. Systems administrator
12. Senior Java developer
13. .NET developer
14. Front-end developer
15. Back-end developer

Source: 15 most in-demand cloud computing jobs, Tech Republic Dec. 6, 2018

Comparative Research

Santa Monica College has a CTE program offering certificates in Cloud Computing with the support of AWS Educate and local industry partnerships. LACCD now has a CTE program in Cloud Computing offering certificates at several of their campuses through AWS Educate and industry partnerships. VCCCD is in the process of developing several certificates and launching two Associate of Arts (A.A) degree programs at Moorpark College. The first A.A degree program will be in Cybersecurity and the second one will be an A.A. degree in Cloud Computing. Dean Mary Rees is leading the effort with the assistance of Professor Ed Garcia. This comprehensive program will provide students with the ability to achieve AWS certifications. The certificates that will be proposed in the future at Moorpark College are in Cloud Security, Cloud Management, and Cloud Services. In order for these programs, certificates, and degrees to be successful at Moorpark College and eventually at Oxnard and Ventura Colleges, we believe that there is a need to increase funding, outreach, and industry partnerships to support the district's efforts to build this exciting program that will benefit the entire district and the students who we serve. By extension, the local economy in the communities surrounding the district and colleges will benefit.

Project Overview

Our project initially set out to support Moorpark College's new Career Education program based in Cybersecurity with the option of A.S. degree and certificate options; thereafter, the intention is to expand the program to both the Oxnard and Ventura campuses to have a district-wide cybersecurity/cloud-computing program that benefits all the colleges and students in the district as well as the local workforce and economy. This program expands on existing curriculum to include additional courses within cybersecurity and more broadly for cloud computing. Cloud computing is the on-demand delivery of IT resources and services via the Internet and widely considered the biggest growth arena in technology today. Cybersecurity is the practice of protecting systems, networks, and programs from digital attacks. It is also known as information technology security or electronic information security and is a critical precursor to broader cloud software implementation and for us, cloud-based curriculums. Collectively, these cyber based technologies are becoming the new normal. Companies no longer ask if they are moving to the cloud but when. Finally, industry experts seek out qualified personnel to fill these types of jobs.

Responding to industry needs, Moorpark College is first developing its Cybersecurity AS degree within its Computer Network Systems Engineering Program (CNSE). The CNSE department recognizes the cloud as an integral component in its curriculum since cloud network design, cloud management, and cloud security, configuration, and monitoring will be the next natural skill set needed to support cloud environments. The intention is to scaffold implementation beginning with security. Amazon is the biggest provider of cloud resources and services. Moorpark College is hoping to enable students to become Amazon Web Services (AWS) certified. Certified AWS Architects and Developers are prepared with the requisite skillset for employment and can earn an average yearly salary of more than $115,000. The Department of Labor's Bureau of Labor Statistics predicts job growth that ranges from 20% to over 38% between 2012 and 2022.

Moorpark College (MC) is currently listed as an AWS Institution and would like to offer its students AWS Security certification. The AWS Educate software is a cloud computing education template developed by Amazon Web Services (AWS) that is available for community colleges to rollout. Before our faculty can offer AWS Authorized courses, they must be certified by AWS Academy. MC faculty (Professors Edmond Garcia and Wayne Snyder) are currently completing AWS certification. Having AWS support is a critical element to the success of this program. As an AWS Academy, MC will have access to authorized curriculum which aligns with best practices and professional training. Also, MC has access to an Online AWS Lab, Certification Prep Exams, and Discounted Exam Vouchers for students going through the AWS Academy. This program will confidently prepare VCCCD students with the skills needed for success in a variety of cloud computing jobs.

Moorpark College hopes to leverage existing infrastructure, online educational resources (OER), and current faculty, while aiming to strengthen partnerships with local industry and K-12 school district partners. At the recommendation of the South Central Coast Regional

Consortium (SCCRC), MC hosted the California Mayor's Cyber Cup on February 23rd, 2019 with 150 Middle and High School students participating live across the state in a cyber-competition while bringing awareness to cyber career pathways. Efforts such as this build pipelines of student interest who eventually arrive to our campuses.

Current challenges faced include deploying a more sophisticated cyber security lab environment to roll out the following new cyber courses: Certified Ethical Hack, Computer Forensics, Cyber Analyst, Python Security, Palo Alto Firewalls, etc. Another challenge is the MC CNSE program has outdated equipment for students to work with and complete simulation labs for their coursework. In addition, limited staffing (bandwidth within the department) impact the ability to apply for available federal funding support. The CNSE program would like to apply to become a National Center of Academic Excellence in cybersecurity.

This distinction, approved through the National Security Agency (NSA) and Department of Homeland Security (DHS), will allow Moorpark College students to qualify for scholarships and grants through the Department of Defense (DoD). This additional federal funding would provide financial sustainability for students and the department. Finally, MC would like to explore the possibility of providing VCCCD's first BS degree option. Additional funding will help sustain this low-cost option for VCCCD students to obtain a valuable career education and secure high wage employment within Ventura County and worldwide. Given that all of this occurs, it will provide opportunity to bring the same or similar certificate and degree programs to Oxnard and Ventura Colleges. Doing so will make the district overall stronger and a leader in the state.

MC CNSE anticipates developing the AWS cloud courses for: Cloud Foundation, Cloud Architecture, Cloud Management, and Cloud Security. MC plans to integrate these courses into its CyberSecurity AS Degree with additional Cloud Certificates based on these courses by Fall 2021. Specifically, the Cyber-Security AS degree will have eleven vendor based professional certifications to produce highly qualified graduates immediately prepared to pursue careers in data and network protection. This advanced cohort of students will be specifically fit to design, manage, and secure cloud environments for enterprises.

Employers who provide Administrative Access to cloud personnel require properly trained, certified, and experienced IT professionals. As such, a CNSE AS Degree and CyberSecurity AS degree provide the appropriate foundation in which to build future cloud programs.

Lastly, Moorpark College is a RedHat Academy (Linux), VMware Academy, (Virtualization), Cisco Academy (Firewalls and Routers), and Microsoft Academy (Microsoft Servers) and is already teaching many technologies used in the Cloud thus the Foundational Skills are already a part of the CNSE AS degree and broader course selection and program offerings is a natural add-on to this foundational curriculum. Moorpark can share this content with Oxnard and Ventura Colleges when they begin development of similar programs at their campus.

None of this comes without cost, as mentioned previously in this report.

As a result, our project is recommending additional support and resources for:

- More sophisticated labs & equipment
- Professional Development (more comparable to industry standards to appropriately support projected growth and change)
- Support to apply for Center of Academic Excellence designation (would provide federal funding support)
- District point person (in addition to Ed Garcia)
- Point person at Coastline College
- Additional support to re-explore Bachelor of Science Degree Option

Implementation Plan

Stakeholders:

The VCCCD, Moorpark, Oxnard and Ventura Colleges

Communication Plan

- Collaborate with the Outreach Coordinators who visit feeder high schools to provide mini presentations to groups of incoming students.
    - Provide information, answer questions and get students excited about this new program and its benefits.
    - Includes any parent night invitations.
- Work with campus marketing specialist to advertise the program on social media, the portal, campus digital marquees, posters, fliers, email, etc.
- Attend all campus resource fair, career fair, tabling events to promote new program.
- Collaborate with First Year Experience programs to provide information at all orientations, parent events, and preview days.

Funding Plan

Until the program is self-sustaining, funding for the cyber-security/cloud-based technologies programs and classrooms can initially be drawn from:

- Perkins
- Strong Workforce (although these have been significantly reduced) - to pay for equipment and training
- Application to become a Center of Excellence - federal funding
- Palo Alto Firewall Academy - access to curriculum and funding
- DoD (Department of Defense) and NSA (National Security Agency)

However, some challenges are inherent in establishing such a program and funding it. The biggest problem is funding access to faculty professional development and training to be current and competitive in the rapidly developing field; the second biggest problem are state of the art classrooms. These are essential to instruction and costly to create and maintain.

The entire proposition of providing additional support for the CNSE Program at Moorpark College cannot happen solely with the existing resources available. As such, additional funding is needed not only to expand it, but to sustain the program and replace outdated equipment with technological advances. Our program budget includes costs for faculty salaries, software

licenses, faculty training, lab computers, classroom furniture and supplies. The budget also accounts for cost increases related to payroll.

A summary of the Yearly Cost Projections for the program's first three (3) years is provided below:

VCCCD CNSE Program Budget Summary

Cost Type	Moorpark	Oxnard	Ventura
Year 1 Payroll Cost	362,187	319,152	319,152
Year 1 Supplies	25,000	135,000	135,000
Less Funds Already in College Budget	-172,822		
Campus Total Operating Budget Year 1	214,365	454,152	454,152
Year 2 Payroll Cost	370,048	327,131	327,131
Year 2 Supplies	25,000	25,000	25,000
Year 2 Funds Already in College Budget	-176,442		
Campus Total Operating Budget Year 2	218,606	352,131	352,131
Year 3 Payroll Cost	378,116	335,135	335,135
Year 3 Supplies	25,000	25,000	25,000
Year 3 Funds Already in College Budget	-180,243		
Campus Total Operating Budget Year 3	222,873	360,135	360,135
TOTAL 3 YEAR BUDGET SHORTFALL	655,844	1,166,418	1,166,418

Moorpark College already has some budget designated towards the CNSE program expansion and therefore has the least budget needs of all three (3) campuses. For both Oxnard and Ventura Colleges, the budget assumption is that there are no funds dedicated to such a program in the existing budget; therefore, they would have a higher initial investment to implement. The potential sources of funding are listed in the Funding Plan section of the project.

At this point we estimate that replacement costs for lab computers of $70,000 in the 4th year of implementation. In addition, the MC PT Faculty and supplies cost must be accounted for in the budget as they are dependent on grants.

The detailed budgets are provided on the following pages.

Operating Budgets

Year 1 - MC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	100,421	72,401	172,822
Full-Time Tenure Track - Faculty	70,686	59,101	129,787
Part-Time Faculty (Six units Per Semester)	24,756	5,033	29,789
Part-Time Faculty (Six units Per Semester)	24,756	5,033	29,789
Total Payroll Cost			362,187

Lab Computers - 40 Students per Classroom			0
Classroom Furniture			0
Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			25,000

Less Funds Already in College Budget			- 172,822
MC - Total Operating Budget Year 1			214,365

Year 2 - MC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	100,421	76,021	176,442
Full-Time Tenure Track - Faculty	73,124	60,401	133,525
Part-Time Faculty (Six units Per Semester)	24,756	5,285	30,041
Part-Time Faculty (Six units Per Semester)	24,756	5,285	30,041
Total Payroll Cost			370,048

Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			25,000

Less Funds Already in College Budget			- 176,442

MC - Total Operating Budget Year 2			218,606

Year 3 - MC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	100,421	79,822	180,243
Full-Time Tenure Track - Faculty	75,561	61,701	137,262
Part-Time Faculty (Six units Per Semester)	24,756	5,549	30,305
Part-Time Faculty (Six units Per Semester)	24,756	5,549	30,305
Total Payroll Cost			378,116

Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			25,000

Less Funds Already in College Budget			- 180,243

MC - Total Operating Budget Year 3			222,873

Year 1 - OC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	70,686	59,101	129,787
Full-Time Tenure Track - Faculty	70,686	59,101	129,787
Part-Time Faculty (Six units Per Semester)	24,756	5,033	29,789
Part-Time Faculty (Six units Per Semester)	24,756	5,033	29,789
Total Payroll Cost			319,152

Lab Computers - 40 Students per Classroom			70,000
Classroom Furniture			40,000
Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			135,000

OC - Total Operating Budget Year 1			454,152

Year 2 - OC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	73,124	60,401	133,525
Full-Time Tenure Track - Faculty	73,124	60,401	133,525
Part-Time Faculty (Six units Per Semester)	24,756	5,285	30,041
Part-Time Faculty (Six units Per Semester)	24,756	5,285	30,041
Total Payroll Cost			327,131

Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			25,000

OC - Total Operating Budget Year 2			352,131

Year 3 - OC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	75,561	61,701	137,262
Full-Time Tenure Track - Faculty	75,561	61,701	137,262
Part-Time Faculty (Six units Per Semester)	24,756	5,549	30,305
Part-Time Faculty (Six units Per Semester)	24,756	5,549	30,305
Total Payroll Cost			335,135

Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			25,000

OC - Total Operating Budget Year 3			360,135

Year 1 - VC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	70,686	59,101	129,787
Full-Time Tenure Track - Faculty	70,686	59,101	129,787
Part-Time Faculty (Six units Per Semester)	24,756	5,033	29,789
Part-Time Faculty (Six units Per Semester)	24,756	5,033	29,789
Total Payroll Cost			319,152

Lab Computers - 40 Students per Classroom			70,000
Classroom Furniture			40,000
Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			135,000

VC - Total Operating Budget Year 1			454,152

Year 2 - VC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	73,124	60,401	133,525
Full-Time Tenure Track - Faculty	73,124	60,401	133,525
Part-Time Faculty (Six units Per Semester)	24,756	5,285	30,041
Part-Time Faculty (Six units Per Semester)	24,756	5,285	30,041

Total Payroll Cost			327,131

Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			25,000

VC - Total Operating Budget Year 2			352,131

Year 3 - VC

	Salary	Associated Payroll Cost	Total
Full-Time Tenure Track - Faculty	75,561	61,701	137,262
Full-Time Tenure Track - Faculty	75,561	61,701	137,262
Part-Time Faculty (Six units Per Semester)	24,756	5,549	30,305
Part-Time Faculty (Six units Per Semester)	24,756	5,549	30,305
Total Payroll Cost			335,135

Software Licenses			7,500
Instructional Supplies			7,500
Faculty Training			10,000
Total Supplies			25,000

VC - Total Operating Budget Year 3			360,135

Data Overview and Analysis

With the advancements in technology, the job markets for Information Technology, Computer Information Systems, and Computer Science are continuously changing. To maintain these career fields, employees must continuously stay aware of advancements in IT to maintain certifications in new technologies in lieu of higher education to attain a career with a decent wage.

Below are some of the top Ventura County IT occupations and their respective education and work experience needs:

SOC	Title	Typical Entry Level Education	Work Experience Required
15-1141	Database Administrators	Bachelor's	< 5 Years
15-1134	Web Developers	Associate's	None
15-1151	Computer User Support Specialist	Some college	None
15-1121	Computer Systems Analyst	Bachelor's	None
15-1132	Software Developers, Applications	Bachelor's	None

Source: Labor Market Profile – Information Technologies, Computer Information Systems & Computer Science; VCCCD Economic & Workforce Development Division

The above chart illustrates that employers are looking for candidates with the education and skills acquired through formal education and training to fill jobs, even without work experience. Further support indicates that student attainment of certifications or degrees will result in employment in many of the sectors previously delineated with or without experience.

Cloud computing jobs are not limited to a single function of IT jobs, but rather touch on a multitude of jobs since it primarily changes the hardware for the Cloud. Further, cloud computing skills are still fairly new to the Labor Market and that data does not exist where Cloud computing skills are a requisite. The data presented reflects the top nine IT jobs where such skills are used. Data presented includes and compares Ventura, Los Angeles, and Santa Barbara Counties with the state of California. For purposes of comparing the data, Standard Occupational Codes (SOC) are used in lieu of Job Titles.

Top Five Projected Growth Areas for Ventura County:

SOC CODE	Occupational Titles	Estimated Employment 2014	Projected Employment 2024	Percent Change
15-1134	Web Developers	310	420	35.5%
15-1121	Computer Systems Analysts	910	1,140	25.3%
15-1122	Information Security Analysts	180	220	22.2%
15-1151	Computer User Support Specialists	1,130	1,380	22.1%
11-3021	Computer and Information Systems Managers	710	860	21.1%

Source: Labor Market Data State of California Employment Development Department

The top five occupational titles demonstrate that Web Developers are the number one growth projections expected in the county with a 35.5% increase by 2024. Web developers include jobs such as Back End Developers; Front End Developers; User Interface Developers; Web Applications Developers; Web Architects; and Web Designers. This is consistent with the tasks associated with Web Developers and the cloud, which include the design, creation, and modification of websites. This also includes the analysis of user needs to implement website content, graphics, performance, and capacity.

Top Ten Projected Growth Areas for Ventura County and Surrounding Areas:

SOC CODE	Occupational Titles	Geographic Area	Estimated Employment 2014	Projected Employment 2024	Percent Change
15-1134	Web Developers	Santa Barbara County	320	530	65.6
15-1141	Database Administrators	Santa Barbara County	90	130	44.4
15-1121	Computer Systems Analysts	Santa Barbara County	410	590	43.9
15-1134	Web Developers	Los Angeles County	6,020	8,190	36
15-1132	Software Developers, Applications	Santa Barbara County	840	1,140	35.7
15-1134	Web Developers	Ventura County	310	420	35.5
11-3021	Computer and Information Systems Managers	Santa Barbara County	570	750	31.6
15-1122	Information Security Analysts	Santa Barbara County	100	130	30
15-1151	Computer User Support Specialists	Santa Barbara County	520	670	28.8
15-1121	Computer Systems Analysts	Ventura County	910	1,140	25.3

Source: Labor Market Data State of California Employment Development Department

The top ten projected occupational growth areas for the Ventura and surrounding counties demonstrate that Web Developers are in the top growth areas for Ventura, Santa Barbara, and Los Angeles Counties. Of these counties, Santa Barbara County reflects the most significant job growth areas by 2024 for the occupational areas of Database Administrators, Computer Systems Analysts, Software Developers, Applications, Computer Information Systems Mangers, Information Security Analysts and Computer User Support Specialists.

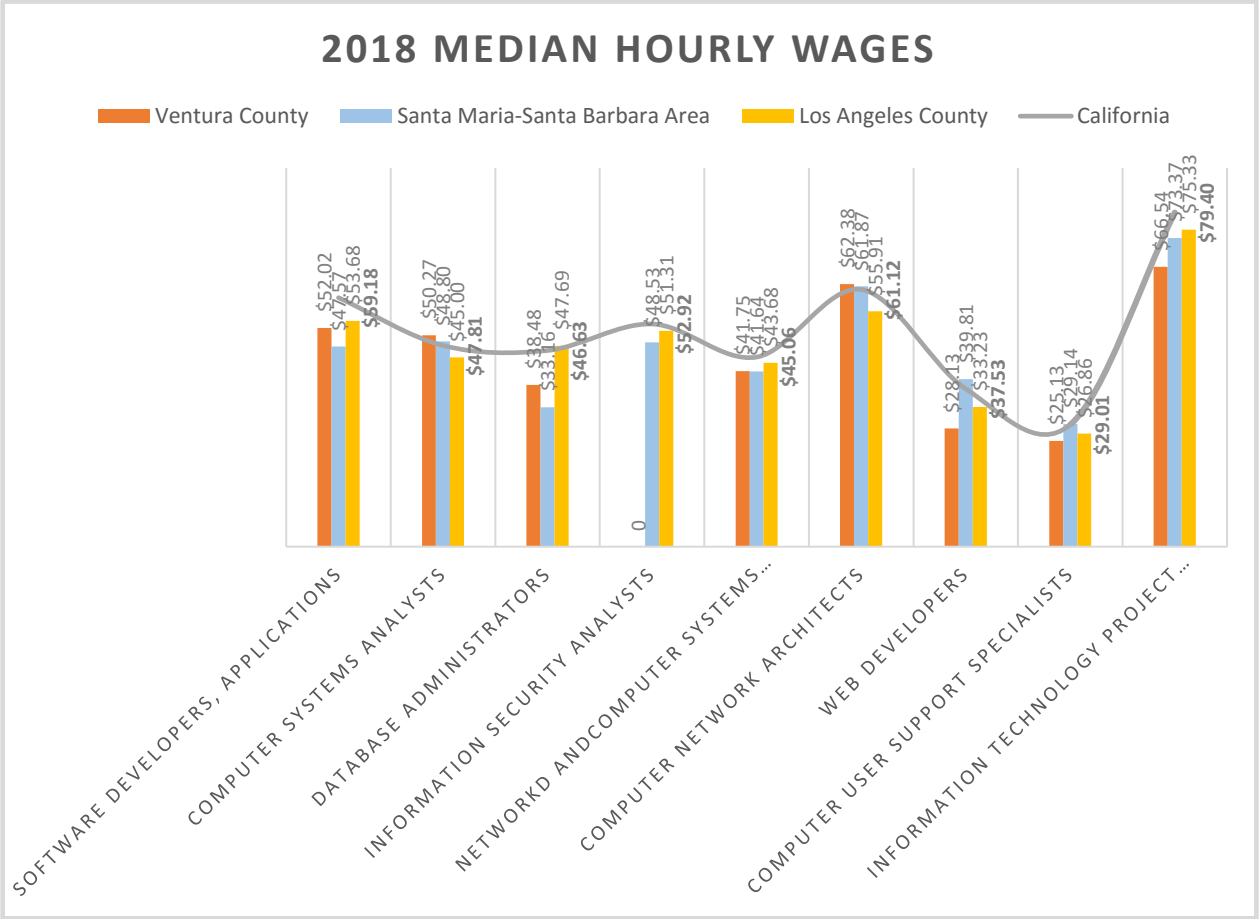
Job Posting Frequency for Ventura County:

Occupational Title	Monthly Average April 2016 – February 2018		Total Postings April 2016 – May 2017	
	Postings	Hires	Total Postings	Unique Postings
Database Administrators	11	8	841	150
Web Developers	53	19	3450	720
Computer User Support Specialist	117	63	7122	1718
Computer Systems Analyst	109	40	7729	1567
Software Developers, Applications	120	39	7730	1731

Source: Labor Market Profile – Information Technologies, Computer Information Systems & Computer Science; VCCCD Economic & Workforce Development Division

The above chart demonstrates the time to fill jobs for some of the top occupational titles in Ventura County. Web Developers had a twenty-two (22) month average of 35% of postings that were not filled from April 2016 to February 2018. The average unfilled was 53% for Computer User Support Specialists and 37% for Computer Systems Analysts thus supporting the need to implement educational programs that meet the needs of our community and surrounding areas.

Potential wages are another important factor students may use to determine career choice and job satisfaction. Current wages for jobs in IT continue to grow and are among the highest paid jobs at the national level. California typically exceed wages due in part to its strong labor laws, wage orders, and hosting of various high technology headquarters in the nation.



Source: Labor Market Data State of California Employment Development Department
Note: No median wage information is available for Ventura County Information Security Analysts

Of the nine SOC wages reviewed for the Ventura and surrounding counties, IT Project Managers are the highest paying jobs with median hourly rates of $79.40 for California compared to $66.54 for Ventura, $73.37 for Santa Barbara, and $75.33 for Los Angeles County. The lowest paying occupations in IT are Computer User Support Specialists with a median hourly rate of $29.01 for California compared to $25.15 for Ventura, $29.14 for Santa Barbara, and $26.86 for Los Angeles County. With some college education, students can start employment in IT jobs earning more than double the state minimum wage of $12.00 per hour. This is a significant difference for students to earn while continuing to attend school to achieve a higher level of education.

In summary, IT jobs continue to be some of the highest paid jobs in the county, while some employers are having some difficulty attracting qualified candidates. Overall support of the CNSE program at the VCCCD will not only benefit our students and communities, but the employers that make Ventura County a great place to live and work.

Risk/Benefit Analysis

While focusing on one campus as the primary campus to establish a program that will eventually become district-wide may in and of itself pose some inherent perception risks, there are other, more pragmatic risks to consider while at the same time weighing the eventual and immediate benefits.

Risks:

- Loss of money (investing in something that is not sustainable)
- Expenditures on costly equipment
- Securing money for federal or foundation grants for students
    - If the above aren't obtainable or sustainable, then the program could be in danger of becoming obsolete
- Enrollments - low-enrolled
- Class cancellations due to low-enrollment
- Lack of qualified faculty
- Faculty who are getting the training are working in the field whereas faculty who are teaching do not have funding for professional development training; therefore, faculty remain minimally qualified and there becomes a small pool of qualified faculty who may teach the classes
- Creating curriculum and not being able to offer classes

Benefits:

- Skilled workforce with high salary for Ventura County creates a strong local economy
- The district remains competitive within a demanding and developing technological area
- Keeping up with rapid changes in technology and creating workers for local businesses
- Meeting the employment needs of industry
- Preparing future faculty to teach the classes
- Student Centered Funding Formula, formerly FTES, creates money for the district – more students = more funding
- District becomes a leader in the state for innovate education and programs for its students
- District becomes a coveted place to work because of the innovative programs
- District sets a benchmark for innovative programs

Outcomes and Measures

- Outcome: To expand the current program currently in place at Moorpark College by adding a Cloud Computing Component in order to provide more opportunities for skills development and higher paying jobs.
- Measure: Secure funding to support the certificate.
- Outcome: Increase student enrollment, success and equity.
- Measure: End of semester/year enrollment reports
- Outcome: Meet the needs of local employers.
- Measure: Labor Market reports.
- Outcome: Help the district support the local economy and contribute to its growth.
- Measure: Labor Market data.
- Outcome: The Cloud Computing program will be complementary to existing Information Technology programs at Moorpark College where skill-sets and background translate to cloud methods and allow for students to help companies with existing on premises data centers to transition to the cloud.
- Measure: Local college data reports
- Outcome: Students will be given an overview of the field of Cloud Computing, its enabling technologies main building blocks, and hands-on experience through projects utilizing public infrastructures with leading cloud technology and tools at low cost to the student. Offer training via Canvas and AWS (Amazon Web Services) to meet the skills need of Cloud Computing jobs.
- Measure: AWS (Amazon Web Services).

Conclusion:

Team Cloud 9 believes that enhancing the existing program at Moorpark College will ultimately benefit all three colleges in in the district. It will create a foundation upon which to build similar programs at Oxnard and Ventura Colleges, and it will eventually become self-sustaining. Though the initial financial investment may be costly, overall, the students, colleges, district, and local economies will benefit.