Regional Advisory
& Industry Skills Panel

Information & Communication Technology

Regional Advisory

Recap Report

March 1, 2019

DOROTHY INGHRAM LEARNING CENTER

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- Background -

The Regional CTE Advisory Pilot Project is funded by the Inland Empire/Desert Region Consortium's Strong Workforce Program. This project answers growing interest and requests to provide a "regional advisory format", accessible to all community colleges, ROP's, and K-12's in our great, diverse region, while also meeting Perkins and other grant requirements. In partnering with CRY-ROP, a dynamic advisory format has been developed. In collaboration with Inland Empire Economic Partnership (IEEP), Regional CTE Advisory Communities are being established, with meetings facilitated throughout the Region. This format allows for a purposeful gathering of educators and industry advisors, sharing their knowledge and expertise on a regional basis, without over-taxing industry advisors with multiple meetings throughout the year.

- Mission -

The mission of this project is to promote student success and to innovate for jobs and the economy; To gather community stakeholders sparking innovative, invigorating conversation between educators and industry professionals. Educators discover the latest business and entrepreneurial trends, industry demands, employment skills needed, and training practices. Industry partners gain an understanding regarding the importance of their expertise and advisement, in areas such as: updating curriculum, new coursework and certificates, equipment and programs needed, thus, benefitting community stakeholders, students, individuals, and businesses.

- Goal -

The overarching goal of this project is to enhance career education and to meet the demands of the economy and the labor market; To evaluate, strengthen, and revise curriculum to ensure alignment from education to employment. Preparing a highly-skilled workforce, meeting today's new and ever-changing industry needs, is at the core. More students will possess valuable skills, earn meaningful certificates, and participate in internship opportunities, leading to living-wage employment in their chosen field of study. Ultimately, career pathways will be improved and jobs will be filled.

Information & Communication Technology Panelist Bios

Mike Good
Account Manager
CISCO, Southern California

Gail Caros
Account Executive
Integration Partners

Gail is a veteran in the "Networking and Security" field with well over 25 years' experience designing, installing, securing, managing and maintaining complex, hybrid networks. Her tenure in the field includes roles as Senior Technical Instructor for vendors that were the leaders in the industry and advancing next generation technologies and standards. Over the last 3 years she has worked with the City and the County of Riverside to bring to the Inland Empire the annual cybersecurity conferences. She currently works with a solutions integrator that offers a full spectrum of security solutions that include everything from providing a virtual Chief Information Security Officers to help clients develop and implement security strategies in order to protect their vital data to performing vulnerability and penetration testing which identifies areas at risk and mediation to remove these threats.

David Thurston
Interim Chief Technology Officer,
San Bernardino County Superintendent of Schools (SBCSS)

David Thurston is Chief Technology Officer for the San Bernardino County Superintendent of Schools where he oversees Technical Services and the Digital Learning Services departments. David's team serves over 33 school districts and supports the educational efforts of more than 400,000 students. He has over 20 years of experience in K12 IT technical and EdTech leadership in the Inland Empire. He is a California Educational Technology Professionals Association (CETPA) Certified Chief Technology Officer (CCTO), and is the instructor for the CETPA Certified Chief Technology Officer Cybersecurity strands and CCTO steering committee member. He has also served as a CCTO mentor and as the chairperson for the CETPA Inland Area Technology Regional Group. He is also a consultant for CA Fiscal Crisis and Management Assistance Team (FCMAT) as an IT specialist study member.

Nathan Estrada
President
Empire Technologies Group

Nathan Estrada is the President and Founder of Empire Technologies and has dedicated all of his professional experience to the fields of IT Network Infrastructure and Security Systems. Since 2005 Nathan has helped large and small business establish viable Networks including the likes of AT&T, Harley Davidson, and Federal Mogul. Nathan specializes in several low voltage technologies including Wireless Networking, Fiber Optics, and Physical Security Systems. Living in Southern California, Nathan enjoys the outdoors and spending time with his wife of 9 years

and his three children.

Vance Little
Assoc. IT Business Consultant / Divisional Engineering Services
Abbott - Abbott Vascular

Vance has worked within Information Technology for 21 years. As he transitioned out of the Marine Corps, he moved into the Healthcare Information Technology working for companies such as Pacificare Health Systems, United Healthcare, and Insight Imaging. For the most recent 12 years Vance has worked for Abbott Vascular, located in Temecula, CA. Throughout his career, Vance has fulfilled various technical and managerial roles. He started out as a Software Developer with Data Warehousing and Business Intelligence systems, later transitioning to Business Analyst, Technical Project Manager, and Engineering Management roles. He has worked across industries, businesses which include healthcare insurance, medical imaging, and medical device manufacturing. Vance's current role is in Divisional Engineering where he manages a team of Engineers and Analysts who support the Organization's global product labeling systems and statistical process control systems used by product manufacturing and distribution facilities.

Scott Murray
Vice President of Technology
Altura Credit Union

With more than 15 years programming and application development experience, Scott is extensively experienced with database modeling theories with physical implementation experience in MS SQL, MS Access and Oracle. His technical abilities are complimented by his experiences with continual process improvement and my dedication to Six Sigma principles (DMAIC).

Information & Communication Technology
Regional Advisory
PANEL QUESTIONS

Question 1
What types of training, education, certifications, or credentials are desirable for entry-level positions in your field?

Question 2
What foundational/technical skills are necessary for entry-level positions within your industry?

Question 3
What interpersonal skills are most important in your industry?

Question 4
What does your hiring process look like?

Question 5
What skills/knowledge is being required of new employees to address the latest trends in technology, equipment, regulations, laws, etc.

Question 6
What skills have become obsolete in your industry due to changes in technology, equipment, regulations, laws, etc.?

Question 7
What new technology and/or equipment should we be incorporating into our courses?

Question 8
Where do you see the field of **Information & Communication Technology** going from here? Important Trends?

Question 9
Based on current trends, what **entry-level** jobs are available at your company by students graduating from high school or community college?

Question 10
Does your company offer Internships or Apprenticeships? If so, what are the technical/non-technical skills needed? Also, what type of work do interns participate in?

Question 11

Any important last words?

<u>Information & Communication Technology Regional Advisory</u>

PANEL NOTES

<u>Panelists</u>

1. **Scott Murray** Vice President of Technology, Altura Credit Union
2. **Vance Little** Assoc. IT Business Consultant / Divisional Engineering Services, Abbott - Abbott Vascular
3. **Nathan Estrada** President, Empire Technologies Group
4. **Gail Caros** Account Executive, Integration Partners
5. **David Thurston** Interim Chief Technology Officer, San Bernardino County Superintendent of Schools (SBCSS)
6. **Mike Good** Account Manager, CISCO

Question 1
What types of training, education, certifications, or credentials are desirable for entry-level positions in your field?

Scott- It depends on the type of position. As far as I'm concerned for an entry level tech. some of the simpler certification. Ex. Secure plus. Looking for passion in the field. I want them to want to move up. I want to see growth. For the more advanced positions I want to make sure they have some of the higher-level certifications such as cisco. You can see a lot from a resume. I always like to have a phone call first to get a feel for how passionate they are about the field.

Vance- To get in the door a lot of times you will need a Bachelor's degree. Preferred. For entry level positions we prefer a Bachelor's degree in something related to the field. You don't have a Bachelors, but you need to have some sort of education and, once again, passion to grow. Project management certs are very helpful. Six Sigma certs are good to have.

Nathan- We don't look at anything very specific for entry level. We like to see some sort of certifications. Big C is a major plus. We like to get an assessment on the core values of a person. Inner personal skills are more important, because we would rather train on the technical side.

Gail- We want someone who is hungry and who is paying attention. We reach out to teachers to see who the best students are. It's not so much on the certifications but the hunger.

David- We look for certificates. Some certs can be considered fluff. None of our entry level positions require a degree, but I would like to see someone who has that because it means they can move up the ladder.

Mike- So we are all about certifications. Cisco has certifications all the way up and down the board. We really look at how you can differentiate yourself from the rest of the people going for the same position.

Question 2
What foundational/technical skills are necessary for entry-level positions within your industry?

Gail- If I do a boot-camp I bring a bunch of equipment and instructions and tell them to put it together. I look to see who can do it quickly and effectively.

David- If we can see a logical process. If they can put things together to figure out what they need to perform. We want to make sure they are able to back up their "fluff" on their resume.

Question 3
What interpersonal skills are most important in your industry?

Was not asked. However, lack of soft skills was addressed throughout.

Question 4
What does your hiring process look like?

Scott- at Alter for the entry level position we will open the position online. We get their resume. I like to see a highlight of skills. I like to do a phone interview to get a feel for the candidate. Then a face to face.

Vance- I do not look at social media. Typically, application online. It goes through an algorithm looking for key words. Recruiter will make a phone call. Then the hiring manager will get a list of candidates to call on a phone interview. Then they will go before a panel. Can take one to two months.

Nathan- We try to ask our current employees for referrals first. Then we will advertise. We do a phone interview and then do an in person to person. We have tried to slow down our hiring process to get better candidates.

Gail- In my company if there is an opening it is usually urgent need. We usually look for referrals first or we will look for good employees that have recently left another company. At entry levels I also like internships.

David- We go through edjoin.org for paper screening. We do have small tests to see that they have good written skills. Then we use a cut off score to narrow the candidates.

Mike- Generally speaking there are a lot of applications. They submit their resume through the website. We usually are looking internally first and then as a last resort we will look to outer candidates. It's better to reach out to the hiring manager themselves and try to get in that way. There are about 10 interviews and criminal background check.

Question 5
What skills/knowledge is being required of new employees to address the latest trends in technology, equipment, regulations, laws, etc.

Scott- Looking for individuals who are really good at localizing and repairing with in the technical environment

Gail- Documentation is huge. You have to be able to write well and be able to describe intelligibly solutions to problems.

David- Mac OS and IOS, I am starting to look more towards scripting as well.

Question 6
What new technology and/or equipment should we be incorporating into our courses? What languages should they be learning and what should they be "playing" with?

Scott- We need to get kids using Linux as soon as possible from a cyber security stand point. Most of the threats are coming from machines using Linux. NoSQL is important to get familiar with as well. I really think education should be formal, regardless of what section you work in your going to need to know the basics of each security.

Vance - Networking. We work with a lot of networking. System configuration and management. We don't work as much with coding. We are looking for people who can manage a networking system.   We are moving more toward robotics and artificial intelligence. We also are looking for data science use and statistics. Cyber security is a huge need.

Nathan- Wireless networks. It would be great to see more education on how the environment can affect your wireless networks.

Gail- Cyber Security. They need to know firewalls and IOTs. You have to understand Artificial intelligence and the edge of the network. Knowing what the latest trends are. Students really need to know how to connect with the cloud.

David- AWS, understanding the basics of cloud storage. I agree Linux is something kids need to learn. Encryption is also a major security plus as well.

Mike- I think wireless is a huge opportunity. Firewalls and cloud are very important today. We have seen a lot of trend in leaving some of the Collaboration behind.

Question 7
Does anyone look at social media during the hiring process?

Gail – Yes, and especially LinkedIn

David – No

Vance – I do not look at social media

Others generally agreed that they do look at social media

Question 8
Based on current trends, what **entry-level** jobs are available at your company by students graduating from high school or community college? *List 2 or 3 titles.*

Scott- Support Technician. System Admin.

Vance- Anything that says level 1 or doesn't have senior title is going to be our entry level Jobs.

Gail- Network Engineers

Question 9
Does your company offer Internships or Apprenticeships? If so, what are the technical/non-technical skills needed? Also, what type of work do interns participate in?

Vance- We have both high school and college internships. We have high school kids that return to us as college interns and that really helps them grow. Travel is also included in our internship program. Paid internship.

David- We do have student workers. A number of our staff is are products of student workers on a college level.

Mike- Internships are largely based around San Jose. But we have a number of smaller sections working towards internship programs as well?

Question 11
Any important last words?

Scott- Python is really important to learn. Raspberry Pi is great to work on learning Linux

Q & A

What does it mean it when someone is hungry?
Scott- If someone is leading you down a path of the things they have learned and showing that they are passionate about technology.

Vance- I offer a lead in question and sit back. I let them tell me everything they want me to know about them. I don't usually ask a lot of questions I let them build themselves up.

Nathan- We want to see people who have questions about the company. We want people who really want to know more about the company.

Gail- I would love to see a job-skills listing so I can see exactly what skills they have currently. Kids need to be able to talk.

David- I would like to see the live portfolio. In the IT entry-level I probably wouldn't go as far as asking for a portfolio.   I usually have a question section at the end of our interview. We are looking for people who show interest in the company.

Mike- You can honestly just tell. If I am not getting that feeling from a person, I may ask a couple questions to see if they can let me know how they may have overcome adversary or accomplished something

Final take-aways:

Internship Programs:

- Vance/Abbott Vascular has a paid Internship Program for high school and community college students. It's a great program. You can reach Abbott to request the information.
- Integration Partners/Gail – Yes, they do provide paid Internships for the right candidates. Contact Gail if you have top students who may be interested.
- SBCSS/David – We have student workers at the County.
- Mike/Cisco – Cisco does have Internships. A lot of them are in San Jose, however, branching out.
- Cisco provides certificates at every level

Important Skills:

- Learn Linux ASAP, also Python and Raspberry Pi
- Understand wireless networks
- Networking configuration & management
- Documenting problems and solutions/write well
- Know the basics of security
- Understanding of cybersecurity Firewalls, IOT's, and Linux
- How to connect to Cloud
- Encryption is a plus
- Mac OS and IOS – looking toward scripting
- Understanding of AI
- SOFT SKILLS
- Eager to work hard; good work ethic

Information & Communication Technology
Regional Advisory
BREAKOUT GROUP QUESTIONS

Question 1

What changes are currently taking place in your programs on your campus?

Question 2

What technology are you currently using?

Question 3

What new courses and technology do you see in your departments in the next five years?

Question 4

What advice would you give to ROP and high school teachers that would help them better prepare students for transition to community college?

Question 5

What are some of the biggest skills gaps that you have identified within the incoming student population?

Other Questions?

Regional CTE Advisory Community – Information & Communication Technology
BREAKOUT GROUP NOTES
Software Development

Question 1
What courses and changes are currently taking place in your programs on your campus?

<u>High School Report-out</u>:

1. Jaime (Summit HS) - Three new pathways in Mechatronics, Ethical Hacks, Computer programming

2. Karen – CTE Pathways from Middle to High School

3. Christopher – A-G Approved for college with CSUSB – Game Development

<u>CC Report-out</u>:

1. Kasey (MVC) – New college security lab – Makerspace in the making – Mobile bus with equipment inside for 3-d printing

<u>Industry Report-out</u>:

Question 2
What technology are you currently using?

<u>High School Report-out</u>:

1. Karen – Reple and Code.Org

2. Jaime – Dell business comp.

3. Chris – New integrated industry ready computers and tablets

<u>CC Report-out</u>:

1. Kasey – Alienware, Rasberry Pie, Virtual Reality, Blender 3-D Printing, Latest Java

Question 3
What new courses and technology do you see in your departments in the next five years?

<u>High School Report-out</u>:

1. Chris – One more section of classes for intro courses and app development so students can leave high school with a lot of experience. Create academy for pathways.

CC Report-out:

1. Kasey – Mecatronics, Artificial Intelligence, robotics and biology progress

Industry Report-out:

1. Portfolio Class

Question 4
What advice would you give to ROP and high school teachers that would help them better prepare students for transition to community college?

High School Report-out:

1. Poor at research

CC Report-out:

1. Kasey – Not reading. No technical document understanding communication. Need more exposure to professional settings and experiences

Question 5
What are some of the biggest skills gaps that you have identified with the incoming student population?

CC Report-out:

1. Problem solving skills

Regional CTE Advisory Community – Information & Communication Technology
BREAKOUT GROUP NOTES
Business Software Applications

Facilitator- James Hattar, Community Recruiter, CRY-ROP james_hattar@cry-rop.org

Note Taker- Deidra Puentes, Community Recrtuiter, CRY-ROP Deidra_puentes@cry-rop.org

Industry- Vance Little, Abbot Vascular, Assoc, IT Business Consultant vance.little@abbott.com

Education- Bruce Ingram, Instructor, CRY-ROP bruce_ingram@cry-rop.org

Question 1: What courses or changes are currently taking place in your programs on your campus?

HS Report-out:
Current Courses: GIS, Microsoft Office Specialist, Digital Business Communications
Technology: Desktop computers, 12 tablets
Instructor also hosts a Video Production Club
Industry-
Software: Sales Force, SAP, Inhouse developed applications
They are moving towards commercially developed applications; document management and storage is important.

Question 2:

N/A

Question 3:

N/A

Question 4: What advice would you give the ROP and high school teachers that would help them better prepare students for transition to community college?

HS Report-
Discussed the importance of problem solving in IT, being able to not only identify the problem but resolve the problem as well.
Industry-
Practices identifying and resolving problems
Work with students on communication skills and the need for students to talk more in interviews especially behavioral interviews. Students should be able to relate their technical and interpersonal skills to the position they are interviewing for.

Question 5: What are some of the biggest skills gaps that you have identified within the incoming student population?

HS Report-out
N/A
Industry
Inability to effectively communicate, demonstrate eye contact, and problem solve.

Regional CTE Advisory Community – Information & Communication Technology
BREAKOUT GROUP NOTES
IT Networking

Question 1

What courses and changes are currently taking place in your programs on your campus?

<u>HS Report-out:</u>

Mark Smith – Oak Hills High School offers:
- Intro to Computer Science
- IT Essentials for A+ certification
- Internet Engineering, I & II (CCNA 1 & CCNA 2) – Has capstone project
- Red Hat System Administration I
- Using VM Ware
- First year participating in Cyber Patriot and California Mayors Cyber Cup (CMCC) competitions.
- Will be offering a future AWS Engineer Program

<u>CC Report-out:</u>

James (Jim) Cregg – Riverside City College offers:
- Netlab configuration – over 15+ years (Virtual and physical environment)
- Computer Forensics
- Moved to Netlab VE (Virtual Environment)
- Business Certified Ethical Hacking
- CCNA 1, 2, 3, 4
- Cisco Certification
- Cyber Security Certification
- Certification programs are state approved and lead to 6 industry certifications (A+, CCNA, Security, LPI 1, LPI 2)
- Participates in Cyber competitions (Cyber Patriot & CMCC)
  - o RCC is looking to start their own competitions with Community College and High School students.

Industry Recommendations:

Karen Stanton – Cisco Networking Academy:
- Constantly adding programs – Linux, Python
- IOT Security course

Question 2

What technology are you currently using?

<u>HS Report-out:</u>

Mark Smith – Oak Hills High School has/will have:
- Has 6 Cisco routers (2901) and 6 Cisco Switches for hands on practice
- Packet Tracer software
- Trying to get servers for MAC emulation
- IT Essentials (A+ preparedness course) – students disassemble old computers and build brand new computers with new and current/better parts.

CC Report-out:
James (Jim) Cregg – Riverside City College has:
- Netlab VE and physical
- 7 router pods
- ASA (for Cisco – Adaptive Security Appliance) device
- Voice over IP
- Roll out carts with old equipment – can roll throughout campus for classroom use
  - 6 routers & 6 switches (mobile hands-on comparison to a rack)

Question 3
What new courses and technology do you see in your departments in the next five years?

HS Report-out:
Garth Masik – Fontana Unifed School District
- Ethical Hacking
- Mechatronics
- Working towards Cisco Academy
- Security

Mark Smith – Oak Hills High School
- Python
- Red Hat (Agile Integration)
- Containerization with Dockers

CC Report-out:
James (Jim) Cregg – Riverside City College
- Cloud Computing
- Virtualization
- Web Services (like Amazon)

Regional CTE Advisory Community – Information & Communication Technology
BREAKOUT GROUP NOTES
Cybersecurity

Community College & High School Faculty

Question # 1
What courses and changes are currently taking place in your programs on your campus?

HS Report-out:

1. Murrieta District and Santiago HS are starting a new Cybersecurity class.

CC Report-out:

1. RCC announced they will have their 2019 RCC Cyber Security CyberCamp on June 11 – 14, 2019. Free to attend, click here to register.

2. County and City working together to help with job placement.

3. Skip Berry from RCC will come to your school and present. Skip.berry@rcc.edu

4. Helping students find internships

5.

Industry Recommendations:

Industry/Name: N/A

Question #2
What technology are you currently using?

HS Report-out:

1. High schools are having trouble working with their I.T. department to get new technology. For example; VM ware.

2. Sharing out with community college

3. I.T. essentials by Cisco

4. NDG - Net lab

5. Building relationships with colleges, sharing resources

CC Report-out:

1. N/A

Industry Recommendations:

Industry/Name: N/A

Question #3
What new courses and technology do you see in your departments in the next five years?

HS Report-out:

1. Tone of A.R.

2. Virtual reality

3. Java script

4. Not using text books

5. code.org provides the leading curriculum for k-12 computer science

6. Raspberry Pi software

CC Report-out:

1. Python

2. Linux

Industry Recommendations:

Industry/Name: N/A

Question #4
What advice would you give to ROP and high school teachers that would help them better prepare students for transition to community college?

HS Report-out:

1. Soft skills

CC Report-out:

1. Articulation agreements

2. Dual enrollment

3. Virtual teaching

Industry Recommendations:

Industry Name: N/A

Question #5
What are some of the biggest skills gaps that you have identified within the incoming student population?

HS Report-out:

1. Math skills

2. Softs skills

3. Translation of what they learned in class to workforce (the switch)

4. Introduce students with workshops example; mock interviews

5. Partnering with community colleges

6. Students don't have computers at home

7. not enough time in class to teach

CC Report-out:

1. Teamwork skills

Regional CTE Advisory Community – Information & Communication Technology
BREAKOUT GROUP NOTES
Computer Science

Community College & High School Faculty

Josh – Facilitator (HS)
Tyler – Notes
John Bruestle – Riverside County Office of Education

Marco (Summit HS) – Robotics pathway, Math-matics
Joann (Chaffey HS) – Science, working of getting more computer science courses
Dana Rice (Murrieta Valley HS) – Computer science pathway being pushed by the district

Question 1
What courses and changes are currently taking place in your programs on your campus?

HS Report-out:

1. Josh – More CT focus. Still teaching kids math and all the different subjects but with robots and Raspberry Pi. Instead of just read this book and do these 50 problems in math rinse and repeat.

2. Marco – Next year we are starting ethical hacking, gaming, and programming. In terms of teacher development, we need to get math teachers who are not computer orientated updated on their knowledge of computers.

3. Dana - I would like to find a way to get in touch with out robotics teacher to get advice on courses. Purchasing the computers and raspberry Pi. Is there a specific model to get? (Amazon and buy a kit was advised)

Industry Recommendations:

1. Raspberry Pi – Linux based. Has Python on there. Minecraft. It's a mini computer. Great for doing build your own projects. Everything can be run off an SD card.

2. Robotics courses incorporating other educational fields

Question 2
What technology are you currently using?

<u>HS Report-out</u>:
1. Raspberry Pi (wireless)
2. Aardino (Not Wireless)(Can be wireless with a Bluetooth adapter)
   - PLCs
3. Getting into the bigger PLCs that control the bigger robotics such as the big robots that move steel beams and welding robots
4. Drone – automation and legal flight. Flying in a specific pattern. Certain Height limits and areas of no-fly zone. 400 ft is the threshold

Question 3
What new courses and technology do you see in your departments in the next five years?

<u>HS Report-out</u>:
1. Drone – automation and legal flight. Flying in a specific pattern. Certain Height limits and areas of no-fly zone. 400 ft is the threshold
2. Moving into industrial robotics. Manufacturing packaging type of robotics FANUC
3. Security on all these systems. Preventing hacking on the systems.

Question 4
What advice would you give to ROP and high school teachers that would help them better prepare students for transition to community college?

<u>HS Report- How out</u>:
1. There has to be communication between the community colleges and the high schools so that we aren't teaching kids something that isn't going to apply to the college classes. How do we better prepare kids for the college classes?
2. Soft skills. Super important for any industry
3. Basic Computer skills in business

Question 5
What are some of the biggest skills gaps that you have identified within the incoming student population?

<u>HS Report-out</u>:
1. Actual computer skills
2. Soft skills – eye contact, shaking hands, etc.
3. Mathmatics – basic math
4. Technical Writing
5. They feel a lack of importance – Students only want to do what they think they need.

Information & Communication Technology Employability Skills Survey Results

Understand the principles of a customer-oriented service approach to users.

Nice to have
100%

Assess the value of various information and communication technologies to interact with constituent populations.
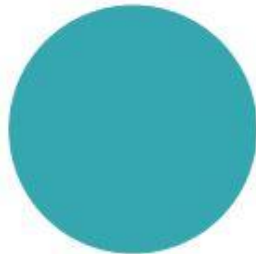
Nice to have
27%

Necessary
73%

Use systems thinking to analyze how various components interact with each other to produce outcomes.
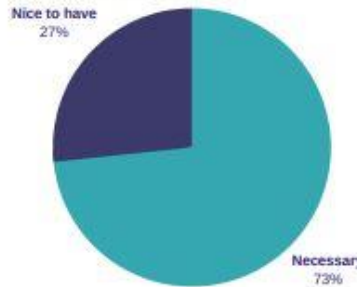
Nice to have
20%

Necessary
80%

Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.
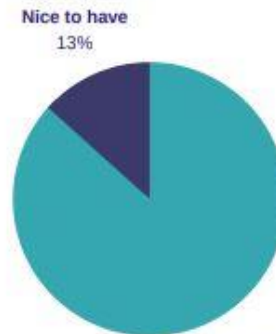
Nice to have
13%

Necessary
87%

Deconstruct large problems into components to solve.
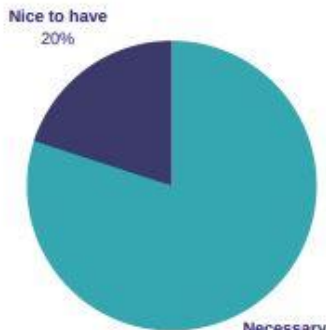
Nice to have
20%

Necessary
80%

Use information and communication technologies to synthesize, summarize, compare, and contrast information from multiple sources.
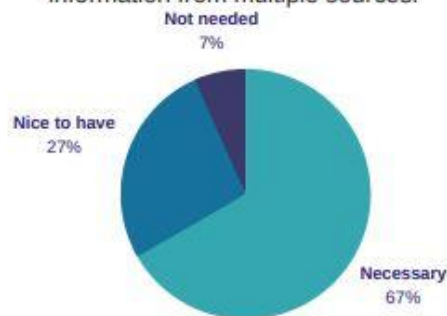
Not needed
7%

Nice to have
27%

Necessary
67%

25

Employability Skills Survey Results
Information Communication Technology

Participate in interactive teamwork to solve real sector issues and problems.

Nice to have 20%

Necessary 80%
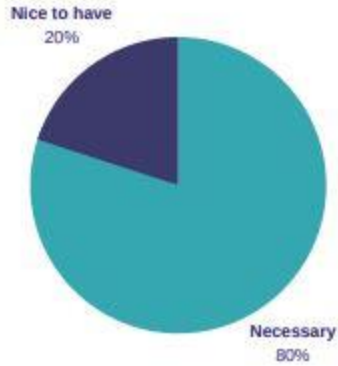
Practice safe, legal, and responsible use of digital media.

Not needed 7%

Nice to have 27%

Necessary 67%
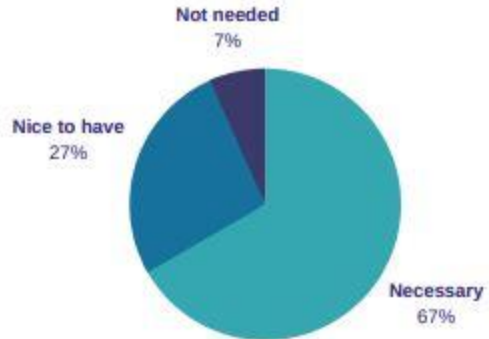
Adhere to copyright and intellectual property laws and regulations.

Not needed 7%

Nice to have 7%

Necessary 87%
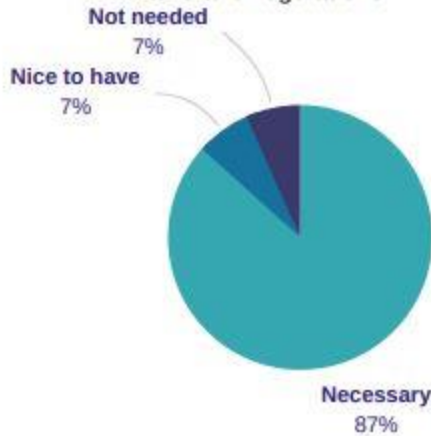
Conform to rules and regulations regarding sharing of confidential information.

Nice to have 7%

Necessary 93%

Understand security concepts including authorization, rights, and encryption.

Not needed 7%

Nice to have 13%

Necessary 80%
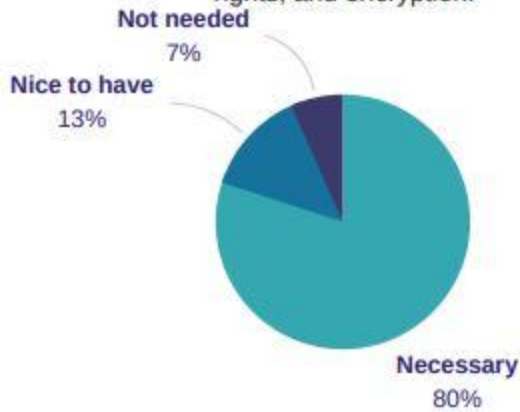
Use common industry-standard software and their applications.

Nice to have 27%

Necessary 73%
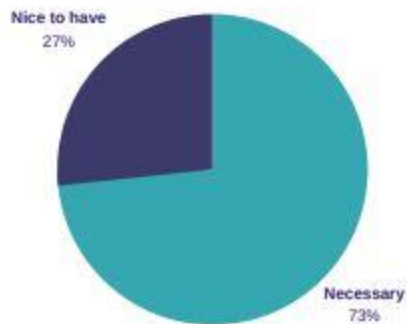
Employability Skills Survey Results
Information Communication Technology

Know multiple ways in which to transfer information and resources between software programs and systems.
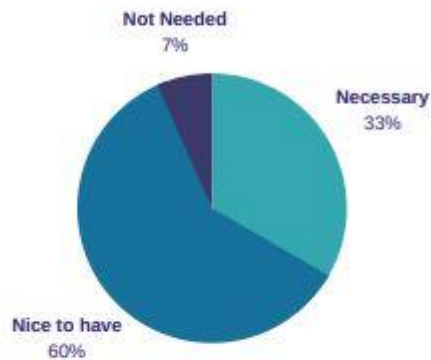
Analyze the effectiveness of online information resources to support collaborative tasks, research, publications, communications, and increased productivity.

Not Needed
7%

Necessary
33%

Nice to have
60%

Not needed
7%

Necessary
40%

Nice to have
53%
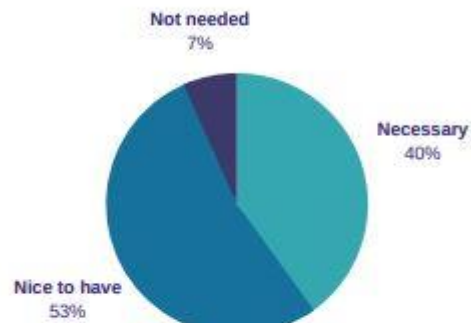
Pathway Skills Additional Comments

- Ability to work effectively with co-workers.
- More streamlined way for handling data for data reports.
- Are you teachable, optimism, grit/never give up, creativity, growth mindset
- Cloud services
- Strong work ethic, love of learning, insatiable curiosity, solution oriented approach, teamwork and collaborative skill sets, ability to work both independently and with a team of peers in different disciplines, respect for every resource made available to you.
- Understanding customer's problems

Acquire, install, and implement software and systems.

Necessary
33%

Nice to have
67%
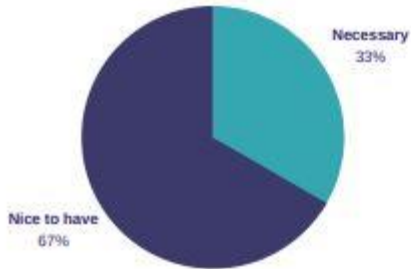
Access and transmit information in a networked environment.

Nice to have
17%

Necessary
83%
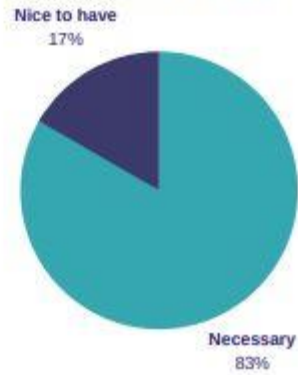
Administer and maintain software and systems.

Nice to have
50%

Necessary
50%
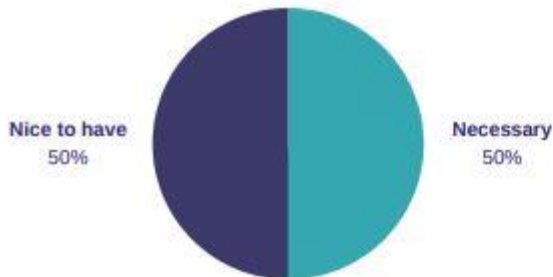
Identify requirements for maintaining secure network systems.

Not needed
17%

Necessary
50%

Nice to have
33%
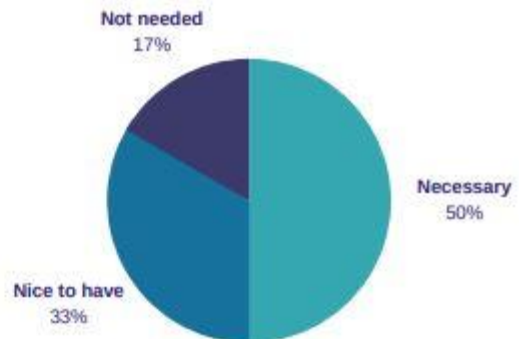
Diagnose and solve software, hardware, networking, and security problems.

Nice to have
17%

Necessary
83%
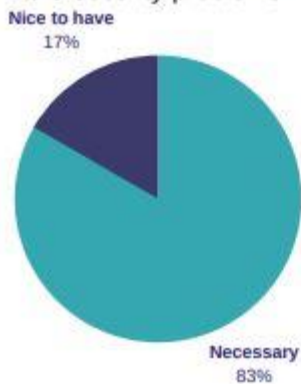
Support and train users on various software, hardware, and network systems.

Necessary
33%

Nice to have
67%
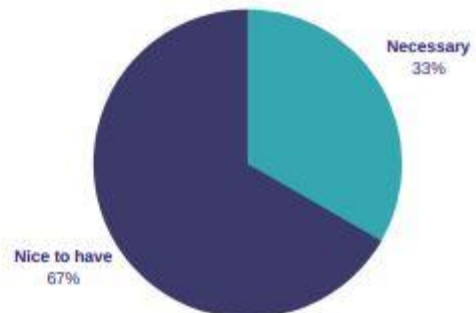
Employability Skills Survey Results
Networking

Identify and describe the principles of networking and the technologies, models, and protocols used in a network.

Nice to have
20%

Necessary
80%
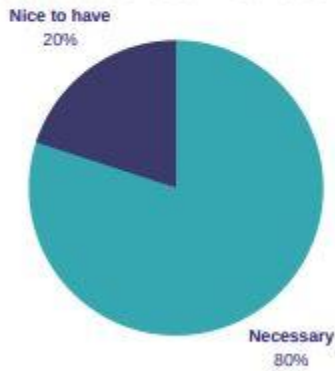
Identify, describe, and implement network media and physical topologies.

Nice to have
20%

Necessary
80%
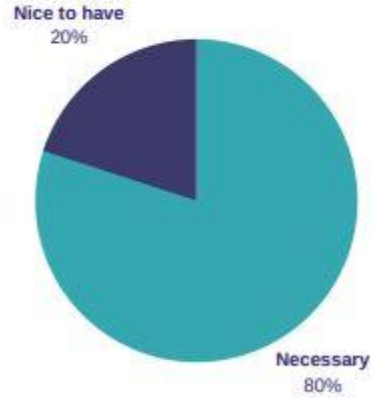
Install, configure, and differentiate between common network devices..

Not needed
20%

Necessary
80%
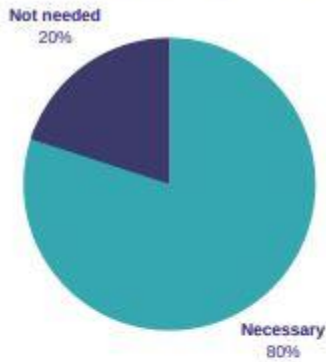
Demonstrate proper network administration and management skills.

Not needed
40%

Necessary
60%
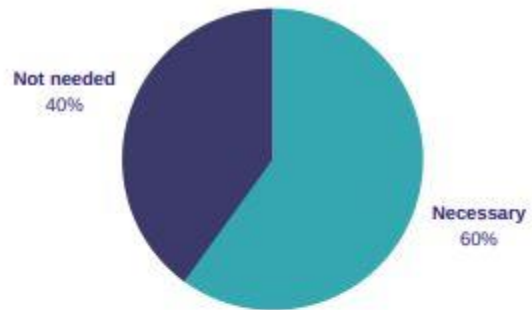
Demonstrate how to communicate and interpret information clearly in industry-standard visual and written formats.

Not needed
20%

Necessary
40%

Nice to have
40%
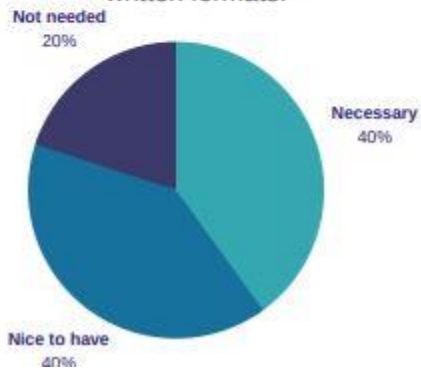
Use and assess network communication applications and infrastructure.
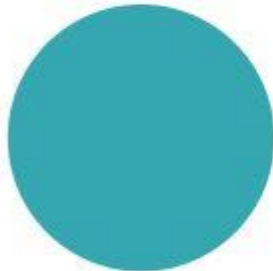
Necessary
40%

Nice to have
60%
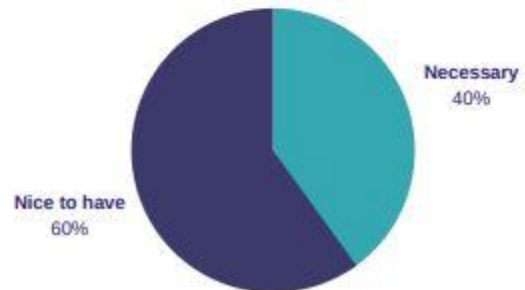
Employability Skills Survey Results
Networking

Analyze a customer's organizational needs and requirements to identify networking needs.

Nice to have
20%

Necessary
80%
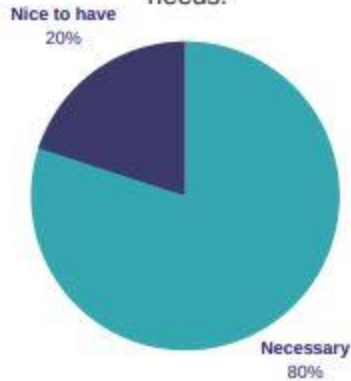
Identify security threats to a network and describe general methods to mitigate those threats.
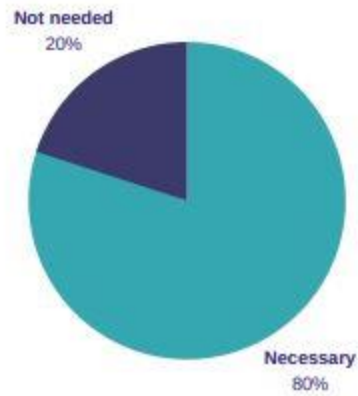
Not needed
20%

Necessary
80%

Identify and describe the principles of networking and the technologies, models, and protocols used in a network.

Nice to have
20%

Necessary
80%
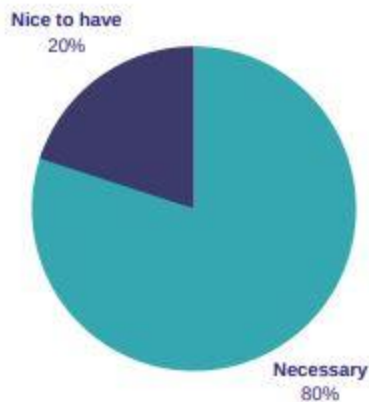
Additional Comments

- Comprehension of L1-L7 technologies and ability to delineate between them. Ability to tolerate the mundane on the road to complexity. Patience. Ability to take instruction, rebuke, correction and incorporate into overall knowledge and experience and then apply in the future.
- Openness. Modesty, Humility.
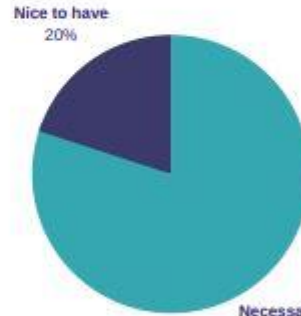
Employability Skills Survey Results
Software & Systems Development

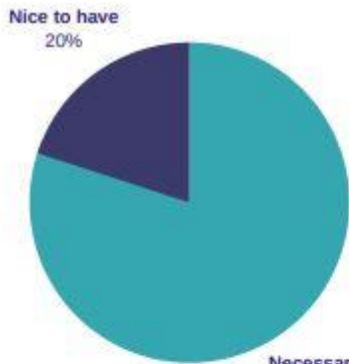Define and analyze systems and software requirements.

Necessary
100%

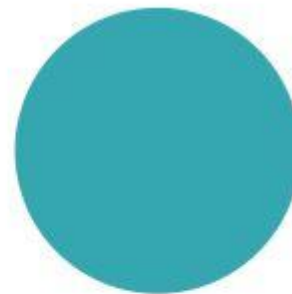Create effective interfaces between humans and technology.

Nice to have
20%

Necessary
80%

Develop software using programming languages.
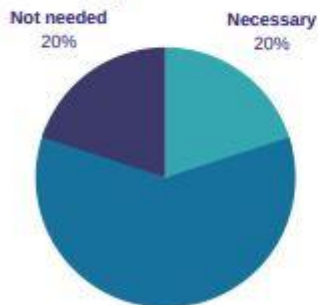
Nice to have
20%

Necessary
80%

Test, debug, and improve software development work.

Necessary
100%

Integrate a variety of media into development projects.

Not needed
20%

Necessary
20%

Nice to have
60%

Develop web and online projects.

Necessary
40%

Nice to have
60%
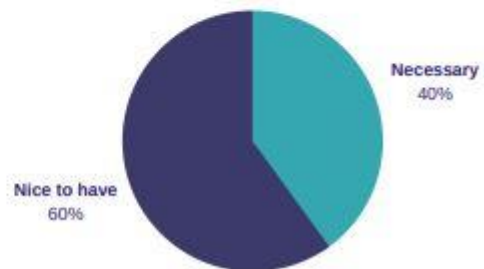
Employability Skills Survey Results
Software & Systems Development

Develop databases..

Nice to have
40%

Necessary
60%
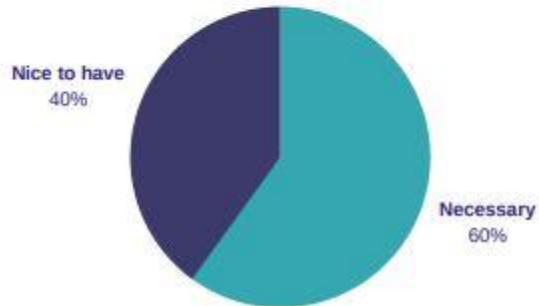
Develop software for a variety of devices, including robotics.

Necessary
40%

Nice to have
60%
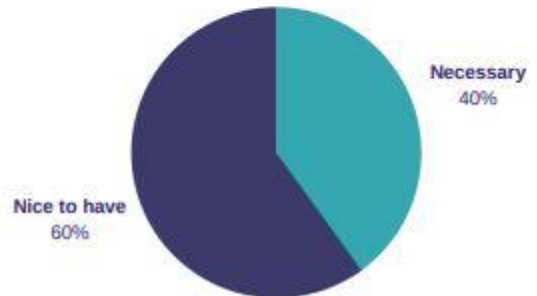
Develop intelligent computing.

Not needed
20%

Necessary
40%

Nice to have
40%
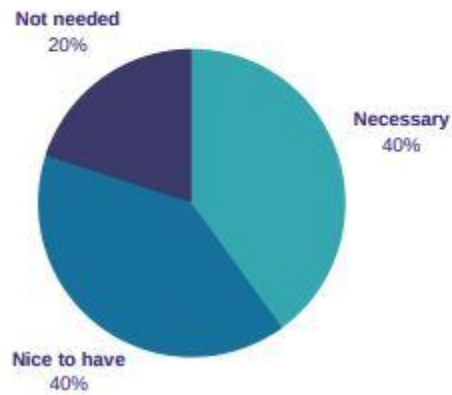
Information & Communication Technology LMI Data

Occupation	2017 Jobs	2022 Jobs	5-yr Change	5-yr % Change	Annual Openings	Entry-Level Hourly Earnings*	Median Hourly Earnings	Typical Entry Level Education
Computer User Support Specialists	3,759	4,047	288	8%	336	$16.17	$25.73	Some college, no degree
Computer Systems Analysts	2,099	2,214	115	5%	159	$25.67	$37.04	Bachelor's degree
Network and Computer Systems Administrators	1,825	1,935	110	6%	137	$24.77	$35.92	Bachelor's degree
Computer and Information Systems Managers	1,257	1,371	114	9%	117	$35.61	$60.56	Bachelor's degree
Computer Network Support Specialists	1,111	1,187	76	7%	97	$20.62	$29.52	Associate degree
Software Developers, Systems Software	1,092	1,181	89	8%	89	$31.14	$46.90	Bachelor's degree
Computer Network Architects	310	337	27	9%	26	$25.68	$43.96	Bachelor's degree
Information Security Analysts	173	202	29	17%	18	$19.61	$47.47	Bachelor's degree
Total	11,627	12,474	847	7%	980	-	-	

Source: EMSI 2018.4
*Entry-level hourly earnings is 10th percentile wage

Program – TOP Code	College	2015-16 Awards	2016-17 Awards	2017-18 Awards	3-Yr Average Awards
Computer Information Systems-070200	Barstow	3	-	-	3
	Chaffey	17	33	45	32
Provides training the following occupations:	College of the Desert	5	6	10	7
• Computer Systems Analysts	Copper Mountain	5	4	5	5
• Computer Network Architects	Crafton Hills	8	11	5	8
• Computer User Support Specialists	Mt. San Jacinto	22	20	25	22
• Information Security Analysts	Palo Verde	57	71	24	51
• Network and Computer Systems Administrators	San Bernardino Valley	8	11	10	10
	Victor Valley	11	22	17	17
	Subtotal/Average	**136**	**178**	**141**	**152**
Computer Networking-070810	Chaffey	93	23	159	92
Provides training for:					
• Computer Systems Analysts					
• Computer Network Architects	Mt. San Jacinto	1	3	2	2
• Computer Network Support Specialists					
• Computer User Support Specialists					
• Information Security Analysts	Riverside City	22	22	31	25
• Network and Computer Systems Administrators					
	Subtotal/Average	**116**	**48**	**192**	**119**
	Copper Mountain	12	8	9	10
Computer Programming-070710	Moreno Valley	7	7	3	6
	Mt. San Jacinto	6	6	5	6
Provides training for:	Norco College	22	25	28	25
• Computer Network Support Specialists	Riverside City	17	21	53	30
• Software Developers, Systems Software	San Bernardino Valley	-	5	5	5
	Subtotal/Average	**64**	**72**	**103**	**80**

Program – TOP Code	College	2015-16 Awards	2016-17 Awards	2017-18 Awards	3-Yr Average Awards
Computer Systems Analysis-070730					
Provides training for:	Riverside City	-	-	7	7
• Computer Network Architects					
• Computer Network Support Specialists					
• Computer Systems Analysts					
	Subtotal/Average	**-**	**-**	**7**	**7**
Information Technology, General-070100					
Provides training for:	Palo Verde	-	-	18	18
• Computer Network Architects					
• Computer Systems Analysts					
• Network and Computer Systems Administrators					
	Subtotal/Average	**-**	**-**	**18**	**18**
	Copper Mountain	4	1	2	2
Software Applications-070210	Moreno Valley	1	4	6	4
	Norco College	2	2	4	3
Provides training for:	Palo Verde	-	1	3	2
• Computer User Support Specialists	Riverside City	8	3	8	6
	Subtotal/Average	**15**	**11**	**23**	**16**
World Wide Web Administration-070900	Moreno Valley	5	1	2	3
Provides training for:					
• Computer Network Architects	Mt. San Jacinto	2	3	5	3
• Computer Network Support Specialists					
• Information Security Analysts	Riverside City	6	5	4	5
• Network and Computer Systems Administrators					
	Subtotal/Average	**13**	**9**	**11**	**11**
	Grand Total/Average	**344**	**318**	**495**	**386**

Source: California Community Colleges Chancellor's Office Management Information Systems (MIS) DataMart

Photos

View all of the photos here: https://photos.app.goo.gl/GkDYXkfNDGcWzYUM8