



# OPPORTUNITIES IN INFORMATION TECHNOLOGY (IT) IOWA CAREER PATHWAYS



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**COMMUNITY COLLEGES &  
WORKFORCE PREPARATION**  
*PROSPERITY THROUGH EDUCATION*

This project was completed by the Iowa Department of Education, in support of the Future Ready Iowa Initiative, through a public/private collaboration with the Technology Association of Iowa, State of Iowa Office of the Chief Information Officer, and Iowa Governor's STEM Advisory Council. Quantitative research was conducted to identify the most common occupations in information technology fields in Iowa, in addition to a series of online surveys and virtual focus groups with employers, educators, and other stakeholders from around the state. This direct feedback and support was vital in building job descriptions and employer expectations, while the included education and wage levels are averaged based on labor market intelligence gathered from across the state.

## FOREWORD

Information technology professionals connect and empower our communities every day in Iowa through safe, reliable, and innovative technologies and services. Steady demand for these products and services to fuel a growing economy, the continued blending of our physical and digital identities, and a growing number of tech companies like Facebook, Google, and Apple relocating to or expanding operations within the state requires skilled Iowans able to design, operate, and maintain these complex technologies, networks, websites, and associated vehicles, machinery, and equipment.

To meet these and similar workforce needs of industries across Iowa, the Governor's Office established the [Future Ready Iowa](#) Initiative with a goal of 70 percent of Iowans possessing education or training beyond high school by 2025. To support this important initiative, the Iowa Department of Education partnered with the Technology Association of Iowa, State of Iowa Office of the Chief Information Officer, and the Governor's STEM Advisory Council to develop these promotional materials and career pathways to highlight a wide range of exciting career opportunities offered in Iowa's innovative and growing information technology fields.

A challenge to readers of this document, from students just beginning to learn about jobs to adults with extensive work experience who may be looking for a career change, is to drop any preconceived notions or ideas they may have about this industry. With an expansive list of specializations, diverse work environments, and innovations in technology, this industry offers much more than more commonly known coding and programming jobs.

Download these pathways and additional resources at [SectorPartnerships.EducateIowa.gov](https://SectorPartnerships.EducateIowa.gov) and [FutureReadyIowa.gov](https://FutureReadyIowa.gov).



# WHAT IT MEANS TO ME

Through a series of focus groups and surveys, we asked Iowans what it means to work in information technology. Below are a few examples of the responses we received from across the state. As reflected in the words and quotes provided, this industry is full of proud, passionate, and hard-working people.

“ I love using different technology to solve everyday problems. ”

“ I can pick up extra side gigs to make more money, but still have time for my family. ”

“ Seeing our direct impact and hearing from happy customers makes my day! ”

“ I'm able to fix my own computer, phone, and other tech to save tons of money. ”

“ The new tech we get to use blows my mind and we get paid to play with it every day! ”

“ If I can go back to school in my 50's, earn a degree, and get a job in IT, anyone can! ”

“ Every day is different and an opportunity to do or learn something new. ”

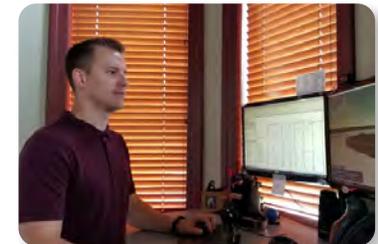
“ The tech community is pretty close-knit and supportive, especially of new people. ”

“ These are actual skills I can use literally anywhere I go in the future. ”

“ I like being able to help my friends and family with problems they have with their tech. ”

“ I keep people and businesses in my community safe from criminals launching cyberattacks from around the world. ”

“ Everything is IT now and everyone can learn these skills, just like any other job. ”



## WHAT IT MEANS TO ME



### CRAIG B. - TECH EDUCATOR FOR NEWBOCO (CEDAR RAPIDS, IA)

"I have a passion for coding and have a lot of education and diverse work experience that I use to resolve client issues in a positive manner, enabling them to overcome the challenges in today's world of technology. With degrees and certificates from SIUC, Kirkwood, and DeltaV Code School, I'm able to develop software applications for clients as well as teach the next generation of developers to help address the tech talent crunch in Iowa!"



### JEANETTE K. - QUALITY ASSURANCE (QA) MANAGER FOR SYNCBAK (MARION, IA)

"I began working in IT over 20 years ago and have never looked back! Most days I work with my team to figure out how to test new technology, mentor the younger team members, and balance our workload so that no one gets overwhelmed. I love the constant innovation, excitement of being in a cutting-edge industry, and collaborating with talented colleagues to create world class products right here in Iowa. Everyone should try a career in IT. You can have a blast doing many things outside of traditional coding, including testing and breaking things."



### TOBY B. - CHIEF TECHNOLOGY OFFICER (CTO) FOR SIOUXLAND FABRICATING INC. (ROCK VALLEY, IA)

"I love learning new things and the challenges that come along with that, which is why I fell in love with technology at a very young age. As a CTO I have the opportunity to do so many different things, such as software development, databases, robotics, servers and networks, and managing and interacting with people. My customers are the employees and I enjoy interacting and serving them every day. I am proud to be a part of the manufacturing industry in rural Northwest Iowa, knowing that I contribute to portions of America's backbone. There is never a boring day in my field and I have yet to wake up and 'go to work' because I get paid to do what I love."



### DIXIE S. - NETWORK SUPPORT SPECIALIST/TEAM LEAD FOR OVATION NETWORKS INC. (CEDAR RAPIDS, IA)

"After working in retail for over 23 years, I decided to go back to school to explore options in IT and jumped at the opportunity to work with my current employer, Ovation Networks. I have enjoyed every day of the past 8 years with them working with the hospitality industry installing and supporting wireless networks for their guests. My day can range from helping a guest get online with the wireless network, remotely helping fix a broken network or installing a new wireless network for a new customer. You never know what's going to come in when you take a call and I feel a sense of accomplishment when I am able to identify and fix the problem."



## TECHNOLOGIES OF THE FUTURE

Although there are already some amazing and innovative technologies in use across the state, below are a few additional examples that have the potential for creating new and exciting tech career opportunities across industries. These technologies further fuel the need for a skilled workforce with advanced critical thinking, information technology, and problem solving abilities. Behind every new or improved technology, network, or system are real people who set up, operate, and update or maintain them as we continue to advance into the future.

### ADVANCED ROBOTICS & MACHINE LEARNING

Continued advances in robotics, artificial intelligence, and machine learning will improve the accuracy, safety, and efficiency of a wide range of industries. Although more intelligent hardware and software will phase out some remedial or manual labor jobs, it will also expand the ability of workers to achieve greater things more quickly, efficiently, and safely, often away from hazardous situations or materials and in unison with collaborative robots (co-bots) and intuitive technology. Teams of skilled professionals will be needed to design, program, test, and maintain these new forms of technology and any associated processes, programs, or business practices that have been improved or redesigned.



### CLOUD COMPUTING & IOT

The Internet of Things (IoT) includes a rapidly growing number of interconnected “smart” homes, appliances, streets, vehicles, and other technology, products, or infrastructure that access vast amounts of data, communicate with one another, and complete tasks for users every day, often with little or no direct human interaction. In addition to simple hands-free and voice-enabled convenience features, cloud computing is also enabling quicker, easier, and more reliable and powerful capabilities that will further enhance or improve our lives while removing many geographical, financial, and technical barriers. Creative and skilled professionals are needed to help design, build, secure, and maintain this new interconnected and continuously evolving future.



### DIGITAL REALITY & PROPERTY MANAGEMENT

As our physical and digital worlds continue to merge, skilled professionals will be needed to support aspects like digital property or asset ownership, banking and financial transactions, and a growing number of other products, services, or identities that reside exclusively in a virtual or digital environment. The secure and reliable oversight, tracking, and insurance or guarantee of transactions, ownership, consumption, and storage within this new digital existence is already evolving quickly through tools or concepts such as cryptography, blockchain, and distributed computing. Visionary and innovative IT professionals are needed to help design, map, and develop this vast new digital frontier.



## FLEXIBLE TRAINING OPTIONS - APPRENTICESHIP PROGRAMS LET YOU EARN WHILE YOU LEARN!

Many Iowa employers offer flexible training options to fit varying schedules, learning preferences, and career goals. Some careers highlighted in this document have a corresponding Registered Apprenticeship option that offers hands-on training and related technical instruction (RTI) that allows Registered Apprentices to earn a paycheck from day one. Work is also underway to develop exciting tech training opportunities through new Industry-Recognized Apprenticeship Programs (IRAP) in Iowa. Look for the *Earn & Learn* logo for a career that is apprenticeable. Visit [EarnAndLearnIowa.gov](https://www.earnandlearniowa.gov) to learn more about these great opportunities, view testimonials from actual apprentices in Iowa, and fill out a form to be contacted by a representative from a local *IowaWORKS* field office for a direct conversation.

Iowa also consistently has the highest number of high school students jointly enrolled in a community college program in the nation, providing students the opportunity to earn college credit and sometimes even full industry-recognized credentials while still in high school. A growing number of careers even include options to begin on-the-job training in high school or through one of Iowa's 15 community colleges, saving further time and money, allowing students and workers to begin planning for their future and earning a paycheck sooner. One such example is offered below, but there are many more across the state as Iowa's employers partner with education and training providers to develop the skilled tech workforce of the future.



### RUAN + DMPS - A SUCCESSFUL IT APPRENTICESHIP PARTNERSHIP!

As an innovative leader in the expanding and fast-paced transportation and logistics industry, Ruan Transportation Management Systems requires a skilled workforce to stay ahead of and leverage advances in technology, including advanced mobility with freight visibility, robotic process automation, and increasingly sophisticated data and analytics.

To address these and future skilled workforce needs, Ruan initiated a technology-based apprentice program in partnership with Des Moines Public Schools' (DMPS) Central Campus in 2017. This paid, competency-based, on-the-job learning program provides the opportunity for high school students in their junior year to gain valuable work experience relating to their current cybersecurity studies and any post-high school education plans. An ideal candidate enjoys technology, has a desire to learn, and is potentially looking for an alternative to a four-year college or university.

Apprentices work under direct supervision in a team environment on assignments that align with their DMPS studies, such as technical support, hardware configuration and deployment, networking, cybersecurity, and other areas. In addition to wages and high school credit, apprentices earn a nationally-recognized apprenticeship program certificate from the U.S. Department of Labor and the opportunity to continue down a number of career pathways with Ruan.



**"I've been very impressed with the quality of apprentices that Ruan receives from Central Campus. Their combination of technical education with a focus on employability skills works really well. Our apprentices come to Ruan with a great base and have the opportunity to gain practical application in a business environment. Ultimately, we are working to create more technologists, and Central Campus is an amazing source."**

- Dan Greteman  
Chief Information Officer (CIO), Ruan



## EXPERIENCE + ENTREPRENEURSHIP - A PATH TO BE YOUR OWN BOSS

Information technology offers huge potential for starting a business and one day being your own boss. A mixture of hard work, tech knowledge, and industry experience opens the door to business opportunities that often do not exist in other industries or that would take much longer and cost significantly more to achieve.

Business owners, professional consultants or contractors, and many advanced tech positions are often held by professionals who specialize in a specific skill, programming language, or technology, rather than possessing numerous advanced degrees or formal education. While education is a critical aspect of being successful in this industry, it is often to supplement what is being learned through shorter, more focused skill development opportunities, such as new or updated technologies or industry standards, and hands-on experiences from an internship, apprenticeship, or other direct work experience.

Budding entrepreneurs can now market their services and speak directly to current and potential customers much more quickly, easily, and cheaply with social media and digital marketing tools. The “gig economy” also provides a consistent flow of both individual or group projects and jobs. Specialized funding is often available through partners like the [Iowa Economic Development Authority](#) and [U.S. Small Business Administration](#) to help plan, launch, and strengthen businesses within Iowa’s innovative and growing tech community.

The diagram to the right highlights a common pathway for someone wanting to start their own tech business as either their own company and direct service provider or that provides contracting and oversight services for other companies or technologies. Although not the only route for ambitious and driven entrepreneurs in Iowa, many appreciate learning on the job, having less student loan debt, and working at their own pace.



**TECH APPRENTICESHIP/TRAINING PROGRAM**  
(Software Developer Apprentice)



**WORK EXPERIENCE/LEADERSHIP ROLE**  
(Lead Software Developer)



**BUSINESS OWNER/CONTRACTING**  
(Software Development Company)

## IOWA TECH ENTREPRENEUR SPOTLIGHT



**Igor Dobrosavljević**, Founder of Grand Consulting (Des Moines, IA)

“I immigrated to Iowa from Europe during my junior year of high school in 1998. I found my first job opportunity in IT not even a year later with an IT consultant helping small businesses with their IT needs. This turned into an educational opportunity that paved the way for the rest of my career, including working for a local phone system company as the Senior Specialist for their IT Services division. In 2008, I decided to break out on my own and founded Grand Consulting, an information technology support company that manages all the digital needs of modern

small- to medium-sized businesses. Located in Des Moines, our support team handles the installation, maintenance, and security of the technology needed to run a successful business. In 2016, we created the first IT Help Desk Specialist Registered Apprenticeship program in Iowa to hopefully open doors to IT for individuals like me that otherwise might not have had one.”



**GRAND CONSULTING**

## DIVERSE WORK ENVIRONMENT OPTIONS - YOU WORK WHERE IN IT?

As the world becomes increasingly technological and interconnected, modern IT professionals are able to specialize and perfect their skills in a wide range of industries, work environments, and causes or areas of interest. This section outlines a few of the more common or growing options in Iowa. Occupations have also been labeled with each throughout the document to assist the reader in finding a stronger match with their personal and professional goals, ideals, or passions in order to make their mark on the world in their own unique ways. Which type of problems do you want to fix?



### Technology Research, Products, & Services

Designing, building, and maintaining technology solutions for Iowa's future



### Business, Trade, & Financial Services

Ensuring safe and secure business and financial transactions for Iowans



### Energy, Utilities, & Power Generation

Providing safe and consistent power and utilities to Iowans



### Automotive, Construction, & Skilled Trades

Designing, building, and maintaining Iowa's structures, vehicles, and roads



### Athletics, Gaming, & Entertainment

Providing fun, safe, and quality entertainment options for Iowans



### Military, Public Safety, & Law Enforcement

Offering a safe and secure environment for Iowans to live, work, and thrive



### Retail, Hospitality, & Food Services

Providing safe and quality shopping, lodging, and dining experiences in Iowa



### Non-profit, Activism, & Community Services

Providing a voice and solutions for underrepresented populations or causes.



### Advanced Manufacturing & Food Production

Designing and creating safe, quality products Iowans use each day



### Health Care, Science, & Services

Offering services and resources to keep Iowans happy, healthy, and productive



### Transportation, Distribution, & Logistics

Moving and storing goods and products throughout Iowa safely and efficiently



### Agriculture, Wildlife, & Environmental Sciences

Studying, farming, and protecting the delicate balance of nature in Iowa



### Government, Public, & Social Services

Providing public support and resources to keep Iowa communities strong



### Education, Training, & Development Services

Educating, training, and preparing the skilled workforce of the future in Iowa



### Advertising, Communications, & Media

Keeping Iowans consistently updated, informed, and connected to the world



### Contract, Consulting, & Self-Employment

Do things your own way to plan, launch, and thrive as an Iowa business



## CAREER INTEREST TYPES - WHAT TYPE OF CAREER MATCHES YOUR PERSONALITY AND INTERESTS?

We are born with certain character traits, while some are developed as we grow and experience new things. There are many different tests or assessments available to help us determine what careers might match our personality or interests. The most common test includes six interest themes based on research by John Holland that can be taken for free at [FutureReadyIowa.gov](https://www.futurereadyiowa.gov). These include the Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C) groups, reflected in the diagram to the right.

After identifying the top three preferred interest areas, a user is left with an interest type code, such as RIS, CEA, or ECR. Occupations in this document have been labeled with these codes to help readers better understand potential matches for further research and investigation. Don't worry if a career doesn't match exactly to your code as this is not an exact science, but rather a starting point to help guide users in their career exploration process. As you will see, there are careers for everyone in information technology!



### R

#### REALISTIC

You like to work with your hands and use physical skills including repairing and making things with tools and machines. You prefer working on projects you can see and feel, not what can be imagined or theorized.

### I

#### INVESTIGATIVE

You tend to focus on ideas and enjoy collecting and analyzing information. You are curious and tend to prefer situations with minimal rules or regulations. You tend to like math and science.

### A

#### ARTISTIC

You focus on artistic self-expression, value independence, and are not afraid to experiment with ideas. You enjoy variety and tend to feel cramped in structured situations. Creativity guides you.

### S

#### SOCIAL

You are highly concerned with people, make friends easily, and are a good communicator. You enjoy working with others to identify and solve problems. You are helpful, friendly, and trustworthy.

### E

#### ENTERPRISING

You are goal-oriented and often provide leadership and a high degree of energy when working with others. You tend to get bogged down by too much science, data, and analytical thinking. You are more comfortable selling and negotiating.

### C

#### CONVENTIONAL

You pay close attention to detail and work well with numbers and data. You prefer following the rules and working with clear expectations.

## USING THESE CAREER PATHWAYS

The information in these pathways is not intended to cover every occupation within information technology in Iowa. Rather, it is intended to provide the student, job-seeker, parent, educator, and others with a high-level view of some in-demand or growing positions. Information has been averaged to help guide the reader in evaluating which of these jobs are of interest and worthy of further research through the online [Future Ready Iowa Career Coach](#) tool, which allows readers to customize labor, salary, education, and other information based on their specific location within the state. Additional recommendations for next steps and a career exploration action plan are included at the end of the document.

Occupations have been grouped into the following three levels based on factors such as typical education, experience, and wages. Many workers in this industry do not follow a direct pathway within the same occupation family, but rather enter and progress through a wide range of different careers from each area of focus. Actual education requirements, job duties, and wage levels will vary from employer to employer around the state. Leadership and management opportunities are available in all families, but may not be reflected in these materials.



# INFORMATION TECHNOLOGY (IT) OCCUPATION FAMILIES

Our increasingly technological and interconnected world requires skilled professionals able to design, develop, build, and maintain the complex computers, applications, networks, and processes that make our lives easier everyday. The occupation families below outline how these careers will be grouped for purposes of this project, by general job duties and role within the diverse and evolving information technology industry in Iowa. Which fits you best?



## APPLICATION & PRODUCT DESIGN - THE INNOVATORS

[Common Interest Types: Investigative, Conventional, Enterprising]

You can see the bigger picture! People present you with a problem, idea, or goal and you find a way to get it done by pulling together all of the various interconnected partners, systems, technologies, and services towards a successful product and satisfied customer. Your ideas, designs, and solutions lead the way.



## PROGRAMMING & DEVELOPMENT - THE BUILDERS

[Common Interest Types: Conventional, Investigative, Artistic]

You create amazing things! Your creativity, desire to build, and top-notch problem-solving skills turn ideas, designs, and theoretical concepts into real applications, products, or services that improve the lives of people around the world every day. You use different types of coding or programming languages to write the instructions that computers, phones, cars, and even spaceships use to safely, consistently, and efficiently accomplish their goals.



## DATA MANAGEMENT & ANALYTICS - THE KEEPERS

[Common Interest Types: Conventional, Investigative, Realistic]

You keep everyone equipped and informed! You help to create, manage, and improve databases and other physical, relational, or cloud-based information storage systems. Your ability to work with numbers and thorough processes or procedures ensure the safe and secure handling, processing, and analysis (or mining) of these vast and expanding amounts of information that hold the secrets to better products and services that make customers happier and businesses stronger.



## INFRASTRUCTURE & NETWORKING - THE CONNECTORS

[Common Interest Types: Conventional, Investigative, Realistic]

You keep everyone and everything connected and working! Every company needs computers, technology, and data to do business and an efficient, safe, and secure method to access or connect these tools and their employees with their customers, suppliers, and other partners around the world. Without your attention to detail and problem-solving skills, everything else would fall apart.



## SECURITY & QUALITY ASSURANCE - THE INSPECTORS

[Common Interest Types: Conventional, Investigative, Realistic]

You catch things others miss! Your eye for detail, thoroughness, and desire to do things the right way help ensure the proper, safe, and secure handling of data, applications, products, and other sensitive or valuable resources, networks, and systems. Your investigative, critical thinking, and problem solving skills are unmatched. You keep everything and everyone in your community safe from dangerous criminals launching cyberattacks from around the world.



## SALES & CLIENT RELATIONS - THE CLOSERS

[Common Interest Types: Conventional, Enterprising, Social]

You seal the deal! Your outgoing personality, competitive nature, and desire to understand customer needs helps companies create products and services that will be valued and purchased. You also serve as the connector between your company and customers, providing support and services so that everyone wins.

# THE CREATION PROCESS – MORE THAN JUST COMPUTERS AND PROGRAMMING!

The occupations outlined in this document often have roles to play throughout a complex and interconnected modern design and development cycle. The diagram below showcases some of these stages and offers a brief description of what is being done, which IT occupation families are likely involved, and how they interact with one another towards a successful end product or service. Testing and failure are an expectation during this creation cycle, causing the revisit to previous stages or even sometimes the need for an entire new cycle. Which stage fits your personality and interest type best?



## 1) PLANNING & SCOPE

Initial stage of determining the scope of a problem, goal, or outcome and potential solutions. Resources, costs, time, benefits, and other items are carefully considered.

**Families Involved:** Application & Product Design, Programming & Development, Data Management & Analytics, and Sales & Client Relations  
**Common Interest Types:** Investigative, Conventional, Enterprising



## 5) INTEGRATION & TESTING

Products are integrated into the new system and thorough testing is completed to determine if the proposed design meets initial goals or expectations.

**Families Involved:** Programming & Development, Data Management & Analytics, Infrastructure & Networking, Security & Quality Assurance  
**Common Interest Types:** Investigative, Conventional, Realistic



## 2) ANALYSIS & REQUIREMENTS

Teams consider the functional requirements of the project or solution. The needs of customers and end users are also analyzed to ensure the new product or service will meet expectations.

**Families Involved:** Application & Product Design, Programming & Development, Infrastructure & Networking, Security & Quality Assurance, and Sales & Client Relations  
**Common Interest Types:** Investigative, Conventional, Realistic



## 6) IMPLEMENTATION & DEPLOYMENT

A majority of the code is completed in this stage based on preliminary testing and when further integration is completed.

**Families Involved:** Programming & Development, Data Management & Analytics, Infrastructure & Networking, Security & Quality Assurance, and Sales & Client Relations  
**Common Interest Types:** Conventional, Realistic, Investigative



## 3) DESIGN & PROTOTYPING

Detailed descriptions are developed for necessary specifications, features, and operations that will satisfy the functional requirements of the proposed product, service, or system.

**Families Involved:** Application & Product Design, Programming & Development, Infrastructure & Networking, and Security & Quality Assurance  
**Common Interest Types:** Artistic, Conventional, Realistic



## 7) OPERATIONS & MAINTENANCE

Final stage where customers and end users are allowed to further modify or customize the product offering and provide feedback for teams to make any necessary repairs or updates in the future.

**Families Involved:** Application & Product Design, Programming & Development, Data Management & Analytics, Infrastructure & Networking, Security & Quality Assurance, and Sales & Client Relations  
**Common Interest Types:** Investigative, Realistic, Enterprising



## 4) PROGRAMMING & DEVELOPMENT

Teams begin to build or develop the new product, service, or system. Any initial observations or necessary changes are documented and completed before moving on.

**Families Involved:** Application & Product Design, Programming & Development, Security & Quality Assurance  
**Common Interest Types:** Conventional, Realistic, Investigative



Professionals in the *Application & Product Design* family focus on designing creative products, services, and solutions to improve or enhance the lives of others within their communities and around the world!

These professionals use their vision and creativity to work with customers to create customized application or product designs, develop graphic user interface models or illustrations, and describe user experience storylines or instructions that will be used by programmers, developers, testers, and other skilled professionals from the other occupation families to turn these ideas into real products, goods, or services.

Many of these occupations require a higher level of formal education, such as an associate's or bachelor's degree, but a growing number are allowing a technical certificate or diploma and little or no industry experience by providing on-the-job training opportunities, such as internships and apprenticeships. Learning and being able to demonstrate a specific skill or programming language is also important, even if self taught.

Someone who is creative, prefers working with ideas and concepts, and can be persuasive to "rally the troops" towards a common goal or vision will do well in these careers. Advances in machine learning, cloud computing, and the Internet of Things (IoT) will continue to change and expand how many of these occupations evolve and are practiced.



## CAREER SPOTLIGHT:

Kevin R. - Founder, Head Designer, & Brand Developer for Riley Designs (Fairfield, IA)

**"After graduating from San Jose State University in 1998, I found myself in the heart of Silicon Valley. Good fortune and a little determination landed me a job at Adobe Inc., where I created digital imagery and assisted in testing and developing new features for their programs. I eventually decided to start my own company and was drawn to Iowa. There is a great and supportive tech community in Fairfield, including the Fairfield CoLab, which is a co-working space for tech entrepreneurs and start-up's. I now design freelance for the web, for print, for store shelves, table tops, labels, billboards, logos, and brands. It feels great to give someone the tools they need to promote and grow their business more efficiently. I work with industry leaders in retail, marketing, advertising, user experience, product development and packaging, in addition to small local businesses. I aim to exceed all client expectations with every project."**



**Riley Designs**  
WEB | GRAPHIC | LOGO | BRANDING





## VIDEO GAME & MEDIA DESIGNER

ENTRY LEVEL

AIC - ARTISTIC, INVESTIGATIVE, CONVENTIONAL

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$16 - \$28/hour

Research, design, and create the initial framework, storyline, and other content or features for video games, movies, animations, and other visual images, files, or media. Work with various forms of digital files, computers, virtual reality, and other electronic tools, technology, and design software. May work as part of a team or individually on broad gaming, entertainment, or multimedia campaigns.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Application & Software Design
- 3) Basic Programming & Development
- 4) Graphic & Digital File Processing
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning

**Similar Roles/Titles:**

Graphic Artist, Game Designer, App Designer, Digital Artist, Multimedia Designer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## USER INTERFACE (UI) DESIGNER

ENTRY LEVEL

ICA - INVESTIGATIVE, CONVENTIONAL, ARTISTIC

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$17 - \$32/hour

Research, visualize, and create appealing designs for programs, applications, and other products or services to meet the needs of specific or target users, clients, and customers, including color schemes, screen layout, and text entry fields. Collaborate with designers, engineers, developers, and other professionals to ensure visual and interface aspects are achieved, work correctly, and enhance user experience.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Application & Product Design
- 3) Basic Coding & Programming
- 4) Deductive & Inductive Reasoning
- 5) Critical Thinking & Problem Solving
- 6) Graphic & Animation Design



**Similar Roles/Titles:**

Interface Design Analyst, User Interface Specialist, Graphic Designer, Software Designer, App Designer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## USER EXPERIENCE (UX) DESIGNER

ENTRY LEVEL

ICA - INVESTIGATIVE, CONVENTIONAL, ARTISTIC

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$17 - \$32/hour

Research, design, and test solutions to provide enjoyable user experiences for programs, applications, and other products based on user interface design specifications, customer feedback, and observed system operation and performance. Collaborate with designers, engineers, developers, and other professionals to ensure products or services function smoothly, achieve desired outcomes, and provide value to end users.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Application & Product Design
- 3) Basic Coding & Programming
- 4) Deductive & Inductive Reasoning
- 5) Critical Thinking & Problem Solving
- 6) Inspection & Attention to Detail



**Similar Roles/Titles:**

User Experience Analyst, User Experience Specialist, User Experience Developer, Software Designer, App Designer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment



## HUMAN FACTORS EXPERT

MID LEVEL

ECI - ENTERPRISING, CONVENTIONAL, INVESTIGATIVE

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$27 - \$41/hour

Research, analyze, and provide guidance or insight on how people use, experience, and feel about technology products and services, using principles from fields such as psychology, engineering, and sociology. Provide recommendations to designers, developers, and other product or project management professionals to resolve issues or enhance products and services to address any physical, mental, or perceptual user expectations, abilities, and limitations.

**Knowledge & Skills:**  
 1) Computers & Technology  
 2) Psychology & Sociology  
 3) Communication & Data Analysis  
 4) Engineering & Design Basics  
 5) Critical Thinking & Problem Solving  
 6) Time & Project Management

**Similar Roles/Titles:**  
 Human Behavior Specialist, Product Use Specialist, Human Use Expert, Consumer Behavior Specialist, Consumer Research Analyst

**Typical Work Environments:**  
 Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## BUSINESS ANALYST

MID LEVEL

ECI - ENTERPRISING, CONVENTIONAL, INVESTIGATIVE

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$18 - \$37/hour

Plan, conduct, analyze, and document findings from research conducted into the systems, processes, policies, or practices of a business, product line, or broader network of interconnected companies, suppliers, and other related partners or competitors. May specialize on specific areas of focus, such as technology integration or data management, or provide general recommendations for improving products, services, business practices, and other financial or efficiency aspects.

**Knowledge & Skills:**  
 1) Data Research & Analysis  
 2) Time & Project Management  
 3) Sales & Negotiation  
 4) Corporate Strategy, Structure, & Culture  
 5) Critical Thinking & Problem Solving  
 6) Basic Application & Product Design

**Similar Roles/Titles:**  
 Business Management Specialist, Organizational Development Consultant, Business Market Analyst, Business Performance Consultant, Product Success Advisor

**Typical Work Environments:**  
 Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## AGILE COACH/ SCRUM MASTER

MID LEVEL

ECS - ENTERPRISING, CONVENTIONAL, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$17 - \$33/hour

Provide leadership and guidance for a quicker and more efficient design and development process for various products, services, or projects through consistent updates, motivation, and support for associated teams of designers, developers, and other professionals. Break complex problems and potential solutions into smaller, easier focuses or projects (sprints) with associated teams, events (ceremonies), milestones, and other rules or guidelines.

**Knowledge & Skills:**  
 1) Computers & Technology  
 2) Scrum & Agile Project Management  
 3) Communication & Negotiation  
 4) Record Keeping & Time Management  
 5) Critical Thinking & Problem Solving  
 6) Leadership & Team Coordination

**Similar Roles/Titles:**  
 Scrum Product Owner, Certified Scrum Developer, Scrum Project Manager, Agile Project Manager, Agile Certified Practitioner

**Typical Work Environments:**  
 Tech, Manufacturing, Finance, Health Care, Energy, Entertainment, Government, Safety, Media, Education, Non-Profit



## PRODUCT OWNER

### MID LEVEL

### EIS - ENTERPRISING, INVESTIGATIVE, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$20 - \$42/hour

Research, identify, and analyze changing customer needs or preferences and potential for new or improved, expanded, or otherwise modified product or service offerings. Collaborate with product development, intelligence, and other sales or client-facing teams to explain product or service vision, desired outcomes or user stories, and potential solutions to ensure product completion, customer satisfaction, and long-term success.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Time & Project Management
- 3) Communication & Leadership
- 4) Sales & Negotiation
- 5) Critical Thinking & Problem Solving
- 6) Basic Programming & Development

**Similar Roles/Titles:**

Project Owner, IT Liaison, Client Support Specialist, User Needs Specialist, Agile Product Owner

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## FRONT END DEVELOPING & TESTING ANALYST

### MID LEVEL

### ICR - INVESTIGATIVE, CONVENTIONAL, REALISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$22 - \$50/hour

Collaborate with designers, developers, engineers, and other staff to update, improve, or otherwise modify applications, programs, web sites, and other systems or tools to ensure functionality and sustainability due to changing technologies, user preferences, and rules or regulations. Leverage various manual and automated test plans or scenarios to identify problems, document their causes, and provide possible solutions to design and development teams.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Programming & Development
- 3) Inspection & Record Keeping
- 4) Deductive & Inductive Reasoning
- 5) Critical Thinking & Problem Solving
- 6) Communication & Data Analysis

**Similar Roles/Titles:**

Client-Side Developer, Design Test Specialist, Software Testing Specialist, Front End Analyst, Front End QA Analyst

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## HARDWARE ENGINEER

### SENIOR LEVEL

### IRC - INVESTIGATIVE, REALISTIC, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$30 - \$55/hour

Research, design, and develop computers, tablets, phones, and other technologies or equipment and accessories, such as gaming keyboards, wearable devices, and AR/VR headsets. Observe, test, and repair products or provide recommendations to improve design, functionality, reliability, or efficiency with new or modified usage instructions, production or installation techniques, and other resources or materials.

**Knowledge & Skills:**

- 1) Computers & Electronics
- 2) Engineering & Technology
- 3) Critical Thinking & Problem Solving
- 4) Inspection & Attention to Detail
- 5) Analytical, Scientific, & Design Software
- 6) Mathematics & Physics

**Similar Roles/Titles:**

Design Engineer, Technology Design Engineer, Computer Hardware Engineer, Systems Engineer, Systems Integration Engineer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit



## PRODUCT MANAGER

### SENIOR LEVEL

ECI - ENTERPRISING, CONVENTIONAL, INVESTIGATIVE

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$33 - \$51/hour

Oversee, track, and manage the design and development of new or improved products and services. Coordinate communication and work between various internal and external teams, customers, or stakeholders to ensure products or projects are completed on time, within budget, and meet customer or user needs. Collaborate with sales and marketing teams on strategies to advertise, release, and gather feedback on products or services quickly, efficiently, and to maximize profits.

**Knowledge & Skills:**

- 1) Management & Leadership
- 2) Sales & Negotiation
- 3) Programming, Design, & Development
- 4) Computers & Technology
- 5) Project & Time Management
- 6) Communication & Marketing

**Similar Roles/Titles:**

Agile Product Manager, Project Developer, Product Developer, Project Lead, Technology Planner

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## SOFTWARE ARCHITECT

### SENIOR LEVEL

CIA - CONVENTIONAL, INVESTIGATIVE, ARTISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$39 - \$71/hour

Research, design, develop, and test software, applications, and specialized programs or systems that require advanced training, experience, and technology. May lead or direct the operations of programmers, developers, and other staff in accordance with contracts, service agreements, and other quality and safety standards. Assist with higher level strategic planning, staffing or capacity review, and high-risk or sensitive projects and client accounts.

**Knowledge & Skills:**

- 1) Advanced Computers & Technology
- 2) Advanced Programming & Development
- 3) Complex Math & Engineering
- 4) Attention to Detail & Inspection
- 5) Complex Critical Thinking & Problem Solving
- 6) Leadership & Team Coordination

**Similar Roles/Titles:**

Senior Software Engineer, Embedded Tech Specialist, Lead Programmer, Lead Developer, Software Engineer Supervisor

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## PROFESSIONALS IN IT SPOTLIGHT:



**Lane M. - Infrastructure & DevOps Team Lead for UFG Insurance (Cedar Rapids)**

"You can have a job, you can have a career, or you can have a calling. I'm fortunate to have found a calling that is now my job! Before going to college, my dad inspired me to build my own computer and I just fell in love with tech. As technology has grown over time, so have my technical skills by having a passion to continually learn something new every day. Today I get to work with some of the latest technology where I never have the same day twice. Combined with working with great people, great leadership, and for a great company like United Fire Group makes every day my best day."



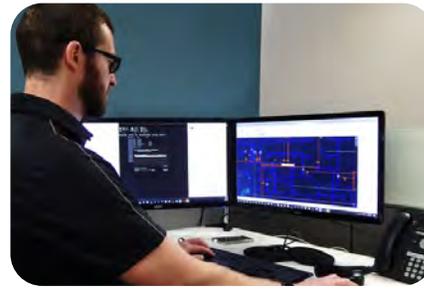


Professionals in the *Programming & Development* family turn ideas, designs, and theoretical concepts into real applications, products, or services that people use every day across Iowa and around the world!

All of the programs, games, apps, and websites used or accessed by computers, phones, cars, appliances, and many other “smart” devices, machines, infrastructure, and technology that make up the expanding Internet of Things (IoT) follow a set of instructions about what to do and show based on what is clicked, typed, said, or otherwise requested by a user. Different kinds of programming or software languages with names like Java or Python are used to develop or write these instructions or scripts to achieve a desired action, goal, or outcome in their physical, digital, or blended reality world.

A growing number of these occupations only require a specialized certification or Associate’s Degree, but some may still require advanced formal education and training. Since many organizations program and develop using specific programming languages or software tools, however, someone could potentially enter this family with very little experience and formal education by being self-taught and proving themselves through testing and project portfolios or through an internship, apprenticeship, or other on-the-job training program.

Someone who enjoys creating things, solving problems, and has an eye for detail will do well in these careers. Advances in machine learning, cloud computing, and other technologies or services will continue to change how many of these occupations are practiced and perfected.



## CAREER SPOTLIGHT:

Usha K. - Senior App Developer for UFG Insurance (Cedar Rapids, IA)

**“I first learned about computer science when I was in 12th grade in India. The idea that problems could be solved through machines generated a spark in me that still lasts. I mentor and provide technical support for the app developers who are stuck trying to solve a problem. I also review code and put an architecture in place that helps to support our business. One of my most important professional accomplishments is seeing others I’ve mentored develop into leaders. I never want to stop learning or solving problems. Every new challenge I come across pushes me to come up with a good, creative solution. There’s never a dull moment. My goal is to always improve and learn new technologies, such as A.I. (artificial intelligence).”**





# PROGRAMMING & DEVELOPMENT

# THE BUILDERS



## PROGRAMMER/ CODER

ENTRY LEVEL

ICA - INVESTIGATIVE, CONVENTIONAL, ARTISTIC

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$18 - \$35/hour

Create, modify, and test the code, forms, and script that allow computer applications or programs to run. Work from specifications drawn up by software designers, developers, and engineers. May also help analyze user needs and design software solutions to store, locate, retrieve, and use specific documents, data, and information.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Math & Data Comprehension
- 3) Basic Coding & Programming
- 4) Inspection & Attention to Detail
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning



**Similar Roles/Titles:**

Computer Programmer, Analyst Programmer, Application Programmer, Computer Programmer Analyst, Coding Specialist

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## SOFTWARE DEVELOPER

ENTRY LEVEL

ICR - INVESTIGATIVE, CONVENTIONAL, REALISTIC

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$22 - \$45/hour

Design, develop, and test software that control computer, network, or system operation, production, storage, and other processes or routines. Set operational or performance specifications, research and identify solutions, and utilize various software tools, programming languages, and design concepts to achieve desired goals or outcomes. Review and provide modifications, upgrades, or improvements to software to adapt to new hardware, security, interfaces, or user needs and preferences.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Programming & Development
- 3) Math & Engineering
- 4) Attention to Detail & Inspection
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning



**Similar Roles/Titles:**

Developer, Systems Software Developer, Systems Software Specialist, Software Engineer, Systems Engineer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## WEB DEVELOPER

ENTRY LEVEL

CIA - CONVENTIONAL, INVESTIGATIVE, ARTISTIC

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$25 - \$35/hour

Design, build, and maintain web sites using programming or scripting languages, content creation and management tools, and graphic or digital media. Analyze site metrics and user needs to match or modify site content, graphics, performance, and capacity. May integrate sites with other computer programs or applications and convert written, graphic, audio, or video components to compatible formats.

**Knowledge & Skills:**

- 1) Computers & Electronics
- 2) Programming & Development
- 3) Web Site Design & Development
- 4) Data Management & Analysis
- 5) Critical Thinking & Problem Solving
- 6) Communications & Digital Media



**Similar Roles/Titles:**

Web Site Specialist, Web Designer, Web Development Specialist, Web Site Analyst, Webmaster

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment



## VIDEO GAME & MEDIA DEVELOPER

MID LEVEL

AIC - ARTISTIC, INVESTIGATIVE, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$22 - \$41/hour

Design, develop, and test video games, 3D animations, graphic special effects, videos, and other visual images or media using computers, tablets, virtual reality, or other electronic tools, software, and programming languages like Java, Python, and C++. May work as part of a team or individually on broad gaming, entertainment, or multimedia campaigns to meet customer needs and ensure a quality product and user experience.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Digital & Graphic Art
- 3) Programming & Development
- 4) Customer & Personal Service
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning

**Similar Roles/Titles:**

Digital Media Developer, Digital Artist, Graphic Artist, Illustrator, Multimedia Producer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## MOBILE/ APP DEVELOPER

MID LEVEL

CIR - CONVENTIONAL, INVESTIGATIVE, REALISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$27 - \$50/hour

Design, develop, and test software that control the programs or applications for mobile, handheld, or wearable devices. Set operational or performance specifications, research and identify solutions, and utilize various development tools, programming languages, and design concepts to achieve desired goals or outcomes. Review and provide modifications, upgrades, or improvements to software to adapt to new hardware, security, interfaces, or user needs and preferences.

**Knowledge & Skills:**

- 1) Computers & Electronics
- 2) Programming & Development
- 3) Mobile & Wearable Technology
- 4) Attention to Detail & Inspection
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning



**Similar Roles/Titles:**

Application Developer, Mobile Dev Specialist, Software Developer, Software Engineer, Application Engineer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## PROJECT MANAGER

MID LEVEL

ECI - ENTERPRISING, CONVENTIONAL, INVESTIGATIVE

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$26 - \$41/hour

Consult and negotiate with internal teams and external customers to determine project details, budget, and deadlines. Coordinate projects and delegate tasks with product owners, product managers, and other supervisors or leads across various design, development, and business operations teams. Monitor, gather, and assess information for project status reports, ensuring compliance and keeping projects on time and within budget.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Time & Project Management
- 3) Communication & Leadership
- 4) Negotiation & Engineering Basics
- 5) Critical Thinking & Problem Solving
- 6) Basic Programming & Development

**Similar Roles/Titles:**

Project Lead, Project Owner, Project Engineer, Project Development Lead, Team Lead

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment



## PROGRAMMING & TESTING ANALYST

MID LEVEL

ICR - INVESTIGATIVE, CONVENTIONAL, REALISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$24 - \$50/hour

Design, develop, and execute software test plans, scenarios, programs, or procedures in order to identify problems or "bugs", their causes, and possible solutions. Document current or potential issues and defects using a bug tracking system and report to software design and development teams. May participate in product design reviews to provide input on functional requirements, product designs, schedules, or potential implications.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Programming & Development
- 3) Inspection & Attention to Detail
- 4) Deductive & Inductive Reasoning
- 5) Critical Thinking & Problem Solving
- 6) Communication & Record Keeping

**Similar Roles/Titles:**

Software Testing Specialist, Software Quality Analyst, Program Test Lead, Testing Analyst, Coding Tester

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## LEAD SOFTWARE ENGINEER

SENIOR LEVEL

CIA - CONVENTIONAL, INVESTIGATIVE, ARTISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$36 - \$58/hour

Research, design, develop, and test software, applications, and specialized programs or systems that require advanced training or experience, such as embedded or integrated technology. May lead or direct the operations of programmers, developers, and other staff in accordance with contracts, codes, and other performance and safety standards. Assist with higher level strategic planning, staffing or capacity review, and high-risk or sensitive projects and client accounts.

**Knowledge & Skills:**

- 1) Advanced Computers & Technology
- 2) Advanced Programming & Development
- 3) Complex Math & Engineering
- 4) Attention to Detail & Inspection
- 5) Complex Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning

**Similar Roles/Titles:**

Senior Software Engineer, Embedded Technology Specialist, Lead Programmer, Lead Developer, Software Engineer Supervisor

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## PROGRAMMING & DEVELOPMENT MANAGER

SENIOR LEVEL

ECS - ENTERPRISING, CONVENTIONAL, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$45 - \$65/hour

Plan, develop, and coordinate higher level programming and development oversight, policies, and strategies, such as forecasting product demand, evolving user needs, and the staffing, contractual, and resource needs to ensure customer satisfaction and long-term company growth. May assist with the recruitment, management, and training of new or current programming and development staff.

**Knowledge & Skills:**

- 1) Management & Leadership
- 2) Communication & Human Resources
- 3) Advanced Programming & Development
- 4) Advanced Computers & Technology
- 5) Market Research & Analytics
- 6) Sales & Negotiation

**Similar Roles/Titles:**

Director of Programming, Development Director, Business Developer, Director of Software Development, Technology Planner

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment



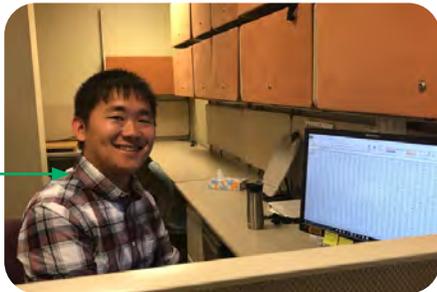
Professionals in the *Data Management & Analytics* family focus on keeping everyone and everything informed and equipped to live, work, and play their best each and every day across Iowa and around the world!

Our interconnected world offers an immense and expanding amount of information, data, and analytics that require specialized professionals able to create programs, processes, or systems to collect, store, access, manage, and process this trove of information to help companies be more innovative, efficient, and successful, while also in compliance with any rules, regulations, and standards.

Advances in cloud computing technology, artificial intelligence, and the rapid expansion of “smart” or interconnected machines, equipment, and devices in the Internet of Things (IoT) is also changing how these occupations are practiced and will continue to evolve with the growing need for quick, secure, and reliable access to data necessary to run increasingly complex and innovative applications, machines, technologies, and other product and service offerings.

Many of these occupations require some form of advanced formal education or training, although a growing number have begun to offer earn-and-learn opportunities such as internships, apprenticeships, and other on-the-job training options for students or job seekers with little tech experience or education.

These occupations may be a good fit for those who enjoy working with numbers, solving problems or puzzles, and have an eye for detail. Organizations need dedicated and trained data management and analytics professionals able to visualize and mine these mountains of data to uncover hidden secrets, patterns, and other advantages if they hope to succeed in our increasingly data-informed world.



## CAREER SPOTLIGHT:

Jared M. - Clinical Data Advisor for UnityPoint Health St. Luke's Hospital (Cedar Rapids, IA)

**“I always knew I wanted to work in healthcare, but it took me a while to figure out where exactly I fit. As a Clinical Data Advisor, I am involved in data collection and review, looking for trends in things like re-admission rates, length of stay, and infections. I am also involved in population health, tracking data for patients with chronic conditions like diabetes, COPD, and congestive heart failure. We use this information to help customize care and develop predictive models to create more targeted care plans. Healthcare analytics is a growing field, and there is going to be an increased need for mathematical/statistical minds. I plan to continue working within the UnityPoint family and want to remain in the business/analytics area of healthcare. If you are even a little interested, give it a shot. Healthcare is a lot more complex and diverse than most people realize and there is something for everyone, including lots of tech roles.”**



**UnityPoint Health**  
St. Luke's Hospital





## COMPUTER OPERATOR

ENTRY LEVEL

CRI - CONVENTIONAL, REALISTIC, INVESTIGATIVE

**Typical Education/Training:** High School Diploma/HSED

**Work Experience:** 0 - 3 years

**Wage Range:** \$14 - \$26/hour

Monitor, coordinate, and control electronic computers, machinery, and other electronic data processing technology or equipment. Inspect, record, and respond to or resolve various error messages in accordance with set instructions or parameters to keep systems operational and data accessible. May assist internal teams or external customers directly with data management or analysis needs, problem identification, and recommendations or solutions.

**Knowledge & Skills:**

- 1) Computers & Electronics
- 2) Customer & Personal Service
- 3) Oral & Written Communication
- 4) Critical Thinking & Problem Solving
- 5) Database Operation & Maintenance Basics
- 6) Data Entry & Record Keeping

**Similar Roles/Titles:**

Database Operator, Computer Console Operator, Computer Specialist, Computer Technician, Systems Technician

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## DATA VISUALIZATION SPECIALIST

ENTRY LEVEL

CAI - CONVENTIONAL, ARTISTIC, INVESTIGATIVE

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$16 - \$28/hour

Manage, analyze, and convert various sources of information or data into visual or 3D elements like charts, graphs, animations, and maps to help identify, document, and leverage otherwise hidden or complex trends, outliers, and patterns. May collaborate with other teams to create and distribute reports, illustrations, or advertising to outline important or beneficial observations, findings, or recommendations.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Data Analysis & Visualization Software
- 3) Inspection & Attention to Detail
- 4) Digital File Handling & Storage
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning

**Similar Roles/Titles:**

Data Visualization Analyst, Data Relationship Specialist, Data & Information Technician, Data Analysis Technician, Digital Information Specialist

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## EXTRACT TRANSFORM LOAD (ETL) ANALYST

ENTRY LEVEL

CRI - CONVENTIONAL, REALISTIC, INVESTIGATIVE

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$17 - \$30/hour

Extract data from various sources to be analyzed, cleaned, and transformed into a new or consistent data file type or resource that is then loaded into a targeted data site, warehouse, or other location. Utilize a suite of applications, programs, and other tools or technology to manually and systematically handle data in a safe, secure, and efficient manner. May create and distribute data analysis and visualization reports or illustrations to detail observations, findings, or recommendations.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Data Management & Analysis
- 3) Inspection & Attention to Detail
- 4) Digital File Handling & Storage
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning

**Similar Roles/Titles:**

Data Capture Specialist, Data Transformation Analyst, Data Extraction Specialist, Data Analysis Technician, Data Conversion Specialist

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit



## BUSINESS INTELLIGENCE ANALYST

MID LEVEL

IEC - INVESTIGATIVE, ENTERPRISING, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$17 - \$35/hour

Research, combine, and analyze various sources of market or business intelligence to identify data patterns or trends that can be used to determine changing consumer needs or preferences, competitive pricing structures, and effective methods for the marketing or distribution of products or services. Prepare data files, reports, and recommendations for sales, marketing, design, compliance, and other business operations or client relations teams.

**Knowledge & Skills:**

- 1) Data Research & Analysis
- 2) Deductive & Inductive Reasoning
- 3) Critical Thinking & Problem Solving
- 4) Advanced Computers & Technology
- 5) Inspection & Attention to Detail
- 6) Communication & Project Management

**Similar Roles/Titles:**

Market Intelligence Analyst, Business Intelligence Specialist, Commercial Intelligence Analyst, Competitive Intelligence Analyst, Data Compliance Consultant

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## DATA CENTER OPERATOR

MID LEVEL

CIR - CONVENTIONAL, INVESTIGATIVE, REALISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$20 - \$38/hour

Monitor, test, and maintain databases, servers, mainframes, and other networks or systems of interconnected computers, equipment, and programs. Collaborate with database administration, engineers, security, and other professionals to escalate issues and troubleshoot solutions to ensure safe, secure, and reliable connectivity, operation, and access to vast amounts of critical data or resources.

**Knowledge & Skills:**

- 1) Database Management & Networking
- 2) Computers & Technology
- 3) Inspection & Attention to Detail
- 4) Critical Thinking & Problem Solving
- 5) Communication & Coordination
- 6) Data Collection & Analysis

**Similar Roles/Titles:**

Data Center Manager, Data Center Specialist, Database Supervisor, Systems Operator, Data Center Analyst

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## DATABASE ADMINISTRATOR

MID LEVEL

CIA - CONVENTIONAL, INVESTIGATIVE, ARTISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$25 - \$50/hour

Administer, implement, test, and patch or repair computer databases to assist in the storage of sensitive data, inventory control records, and other sources of information that need to be referenced or accessed by various staff, programs, and other systems or networks. Stay updated on advances in technology, cybersecurity needs, and industry trends to ensure data is safeguarded, accessible, and private at all times.

**Knowledge & Skills:**

- 1) Database Management & Networking
- 2) Computers & Technology
- 3) Communication & Project Management
- 4) Critical Thinking & Problem Solving
- 5) Analytical & Scientific Software
- 6) Data Collection & Analysis



**Similar Roles/Titles:**

Data Architect, Data Controls Manager, Database Coordinator, Information Systems Manager, Database Manager

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit



## STORAGE ENGINEER

### SENIOR LEVEL

ICS - INVESTIGATIVE, CONVENTIONAL, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$26 - \$55/hour

Design, model, implement, and test corporate data storage, handling, and analysis activities. May supervise or direct operators, technicians, and analysts engaged in database or storage activities to ensure safe, accurate, and reliable access and operations of associated programs, networks, and systems. Collaborate with engineers and department heads to purchase and install new or improved hardware or software equipment and components.

**Knowledge & Skills:**

- 1) Database & Storage Control Systems
- 2) Management & Leadership
- 3) Security & Compliance
- 4) Communication & Engineering
- 5) Critical Thinking & Problem Solving
- 6) Math, Data, & Analytics

**Similar Roles/Titles:**

Information Storage Engineer, Data Analysis Manager, Data Architect, Information Engineer, Data Warehouse Manager

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## DATA SCIENTIST

### SENIOR LEVEL

IRC - INVESTIGATIVE, REALISTIC, CONVENTIONAL

**Typical Education/Training:** Master's Degree

**Work Experience:** 8+ years

**Wage Range:** \$27 - \$56/hour

Plan, lead or conduct research using various scientific methods, processes, algorithms, and systems to extract knowledge and insights from data, either individually or as part of a team from diverse areas of study and specialization. Analyze findings closely to spot any trends, concerns, implications, or promising findings and present information in-person or with reports and visualizations to upper management, compliance team, or investors.

**Knowledge & Skills:**

- 1) Advanced Computers & Technology
- 2) Math, Data, & Analytics
- 3) Inspection & Attention to Detail
- 4) Advanced Design & Data Software
- 5) Complex Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning

**Similar Roles/Titles:**

Data Engineer, Data Science Engineer, Research Scientist, Data Manager, Data Compliance Manager

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## DIRECTOR OF BUSINESS INTELLIGENCE

### SENIOR LEVEL

IEC - INVESTIGATIVE, ENTERPRISING, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$28 - \$63/hour

Plan, direct, and coordinate the activities of an organization's capture, analysis, and use of market or business intelligence and other sources of data and information in accordance with security, regulatory, and safety standards. Leverage observations, trends, and other research findings to avoid costly mistakes, expand current and new market share, and strengthen supplier and customer relationships to ensure long-term success and profitability.

**Knowledge & Skills:**

- 1) Management & Leadership
- 2) Deductive & Inductive Reasoning
- 3) Complex Critical Thinking & Problem Solving
- 4) Advanced Computers & Technology
- 5) Contracts & Regulatory Affairs
- 6) Advanced Data Analysis & Visualization

**Similar Roles/Titles:**

Director of Market Intelligence, Business Intelligence Manager, Commercial Intelligence Manager, Strategic Intelligence Officer, Strategic Information Officer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

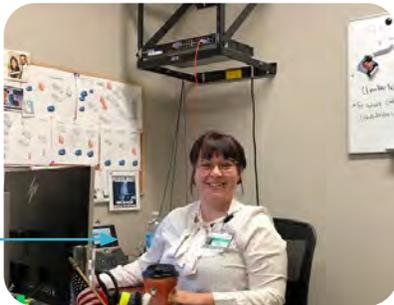


Professionals in the *Infrastructure & Networking* family play the critical role of keeping everyone and everything in our daily lives connected and working!

Every company needs computers and technology to do business and an efficient, safe, and secure method to connect employees not only with each other, but also the outside world and various sources of data or information across broad and interconnected networks, systems, and databases. This is often easier said than done, however, due to sudden or uncontrollable factors like severe weather, power outages, and cybercrime. IT professionals are needed to quickly resolve these and other issues to ensure teams from the other occupation families are able to acquire and use the necessary equipment or technology to communicate, access important information or resources, and work their best each and every day.

Although many of these careers will require an associate's or bachelor's degree and a specialized certification or training to be successful, a growing number of companies have begun to offer earn-and-learn opportunities such as internships, apprenticeships, and other on-the-job training options for students or job seekers with little tech experience or education.

Someone with an appreciation for technology, enjoys testing and solving problems, and is able to work under pressure will do well in these careers. An eye for detail and ability to think quickly is also often needed to solve sudden issues and stay ahead of potential network, service, or other technology and resource disruptions.



## CAREER SPOTLIGHT:

Amber P. - Network Administrator for Grand River Medical Group (Dubuque, IA)

**"I started working on fixing computers as a hobby to help others and discovered that I was really good at it! As a Network Administrator, I do a pretty broad range of things, such as overseeing network security, maintaining our firewalls, and monitoring network threats. I also supply end user support, along with server and device maintenance, patches, and upgrades. I manage many of our vendor relationships and contracts as well. Information technology is an endless spectrum that feeds my love of learning, being challenged, and of technology. There will always be a demand for people in technology. Every place you go has it, and every place needs workers that understand it and that can support it. Never say 'never' or 'I can't' and don't let excuses hold you back!"**







## NETWORK & PRODUCTION SUPPORT SPECIALIST

ENTRY LEVEL

REC - REALISTIC, ENTERPRISING, CONVENTIONAL

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$15 - \$26/hour

Receive, document, communicate, and track network or system support and service requests from internal teams and external customers or users to network operators, analysts, engineers, or other professionals. May assist with monitoring, testing, and system or network patching or repair needs. Prepare reports based on observations and data analysis for technology, staffing, or network improvements.

**Knowledge & Skills:**

- 1) Computers & Networking
- 2) Digital & Diagnostic Testing
- 3) Inspection & Attention to Detail
- 4) Data Management & Storage
- 5) Critical Thinking & Problem Solving
- 6) Time & Project Management



**Similar Roles/Titles:**

Computer Network Technician, Production Support Analyst, Network Tech Support, System Support Analyst, IT Generalist

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## TECHNICAL ANALYST

ENTRY LEVEL

CEI - CONVENTIONAL, ENTERPRISING, INVESTIGATIVE

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$16 - \$28/hour

Consult, research, and advise internal teams or external organizations or customers on infrastructure, networking, and computer system needs. Design, purchase, and connect the necessary hardware, software, and other components for new or improved systems and solutions based on technology usage, performance, operation, efficiency, and other desired outcomes and goals. May also help write or develop programs to deal with specific or customized system needs.

**Knowledge & Skills:**

- 1) Project & Time Management
- 2) Computers & Technology
- 3) Research & Data Analysis
- 4) Basic Programming & Development
- 5) Critical Thinking & Problem Solving
- 6) Communication & Negotiation

**Similar Roles/Titles:**

Technical Support Analyst, IT Systems Consultant, Office Technology Consultant, Solutions Strategist, Business Analyst

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## NETWORK OPERATOR

ENTRY LEVEL

RIC - REALISTIC, INVESTIGATIVE, CONVENTIONAL

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$18 - \$30/hour

Monitor, test, troubleshoot, and repair, patch, or otherwise modify partial or full network systems, such as local area networks (LAN) and wide area networks (WAN). Perform routine network maintenance to ensure secure, reliable, and efficient operation. Collaborate with security or database teams on network or data access permissions, settings, and connectivity or system breach precautions and response plans.

**Knowledge & Skills:**

- 1) Computers & Networking
- 2) Digital & Diagnostic Testing
- 3) Inspection & Attention to Detail
- 4) Data Management & Storage
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning

**Similar Roles/Titles:**

Computer Network Operator, Network Consultant, Network & System Consultant, Network Technical Analyst, System Operator

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit



## INFRASTRUCTURE/ NETWORK ENGINEER

MID LEVEL

IRC - INVESTIGATIVE, REALISTIC, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$27 - \$47/hour

Design, install, and maintain the various hardware and software components of an organization's IT network, including the interconnected computers, servers, routers, printers, and other technology or equipment. Monitor, test, and make recommendations for how to improve, repair, or replace any associated components to ensure network or system availability, reliability, and security.

**Knowledge & Skills:**

- 1) Advanced Computers & Technology
- 2) Engineering & Physics
- 3) Database & Network Management
- 4) Digital & Diagnostic Testing
- 5) Critical Thinking & Problem Solving
- 6) Math, Data, & Analytics

**Similar Roles/Titles:**

IT Infrastructure Engineer, Systems Engineer, IT Systems Manager, Network Architect, IT Infrastructure Manager

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## CLOUD ENGINEER

MID LEVEL

IRC - INVESTIGATIVE, REALISTIC, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$22 - \$45/hour

Design, plan, and manage the access, storage, and processing of data, applications, and other system or network components and processes that reside online rather than on an organization's physical servers or hard drives. Test, analyze, and provide routine maintenance and support to ensure reliability, security, and operations, providing recommendations when necessary to improve efficiency, automate processes, and optimize cost or performance.

**Knowledge & Skills:**

- 1) Cloud Computing & Storage
- 2) Math & Engineering
- 3) Deductive & Inductive Reasoning
- 4) Programming & Development
- 5) Critical Thinking & Problem Solving
- 6) Data Management & Analysis

**Similar Roles/Titles:**

Cloud Architect, Cloud Systems Engineer, Cloud Network Engineer, Cloud Computing Specialist, Cloud Network Analyst

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## SYSTEMS ANALYST

MID LEVEL

ICE - INVESTIGATIVE, CONVENTIONAL, ENTERPRISING

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$27 - \$47/hour

Plan, conduct, and document findings from research conducted into networks, systems, infrastructure, and related technology and equipment. Analyze user requirements or preferences, policies or procedures, and known or potential system capacity, workflow, and scheduling limitations or barriers. Provide recommendations for system repairs, improvements, automation, and other diverse solutions.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Time & Project Management
- 3) Sales & Negotiation
- 4) Database Management & Networking
- 5) Critical Thinking & Problem Solving
- 6) Research & Data Analysis

**Similar Roles/Titles:**

Applications Analyst, Business Systems Analyst, Computer Systems Consultant, Information Systems Analyst, Information Technology Analyst

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment



## NETWORK/ SYSTEMS ADMINISTRATOR

MID LEVEL

IRC - INVESTIGATIVE, REALISTIC, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$23 - \$43/hour

Install, configure, and manage an organization's various internal and external telecommunication systems, such as local area networks (LAN) and wide area networks (WAN). Monitor, test, and provide routine maintenance to networks, systems, web sites, and any associated security, access, use, and performance measures or restrictions to ensure secure, reliable, and efficient access and connectivity.

**Knowledge & Skills:**

- 1) Networking & Database Management
- 2) Computers & Technology
- 3) Math & Engineering
- 4) Critical Thinking & Problem Solving
- 5) Analytical & Scientific Software
- 6) Data Collection & Analysis



**Similar Roles/Titles:**

Information Systems Manager, System Access Coordinator, Network Coordinator, Network Manager, Network Access Coordinator

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## IT ARCHITECT

SENIOR LEVEL

ECI - ENTERPRISING, CONVENTIONAL, INVESTIGATIVE

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$30 - \$60/hour

Research, design, and implement computer and information systems and networks, such as local area networks (LAN), wide area networks (WAN), intranets, extranets, and other data communications networks. Oversee the routine maintenance and staged system or network outages, failures, or cyberattacks in coordination with other department heads. Stay updated on industry trends, user preferences or needs, and recommend new or improved network and data communications hardware and software.

**Knowledge & Skills:**

- 1) Advanced Computers & Technology
- 2) Complex Network & Telecommunication Systems
- 3) Leadership & Management
- 4) Research & Business Intelligence
- 5) Critical Thinking & Problem Solving
- 6) Deductive & Inductive Reasoning

**Similar Roles/Titles:**

Director of IT, Information Systems Architect, Lead Network Engineer, Senior Systems Engineer, Telephony Architect

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## DIRECTOR OF OPERATIONS

SENIOR LEVEL

ECS - ENTERPRISING, CONVENTIONAL, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$39 - \$58/hour

Plan, direct, and coordinate the general operations of an organization across such fields as data processing, information systems, and computer programming. Communicate policies, review financial statements or performance data, and plan the use of materials and human resources to keep operations running smoothly and profitable. Examine existing operations for opportunities to streamline staffing, processes, systems, or procedures to meet contractual, regulatory, or operational goals.

**Knowledge & Skills:**

- 1) Management & Leadership
- 2) Accounting & Finance
- 3) Critical Thinking & Problem Solving
- 4) Computer & Technology Systems
- 5) Contracts & Regulatory Affairs
- 6) Negotiation & Sales

**Similar Roles/Titles:**

Operations Manager, Business Manager, Operations Director, Director of Business Management, General Manager (GM)

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

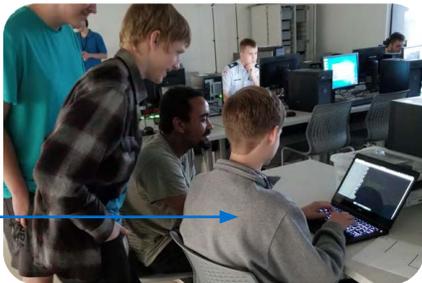


Amazing and continuous innovations in technology as part of our increasingly interconnected world provides users not only with convenience and entertainment value, but also unfortunately a growing number of security, privacy, and quality assurance challenges. Professionals in the *Security & Quality Assurance* family work to keep everything and everyone safe, secure, and working efficiently in our physical, digital, and increasingly blended realities.

Many of these careers will require some formal education and a specialized certification or training to be successful. Like other occupation families, however, a growing number of companies are embracing earn-and-learn models like internships and apprenticeships to train and develop their skilled workforce. These occupations can also be a good entry into IT for anyone without a strong tech background, since a large aspect of modern security measures involves psychology, social engineering, and other human behavior factors that lead people to either commit cybercrimes or fall prey to them.

New and exciting advances in areas like machine learning, cloud computing, and cryptocurrencies will continue to change how we practice these types of occupations. Many companies have to be on guard around the clock to update, protect, patch, or otherwise repair products, networks, or services to meet a growing consumer demand, changes in technology or regulations, and increasingly intelligent and evasive malicious or criminal attacks with viruses, ransomware, phishing, hacking, and other complex system breach schemes.

Someone with an eye for detail, enjoys understanding how people and things work, and likes to solve problems will do well in these careers. Remaining updated on security trends or threats and an appreciation for following checklists, policies, and procedures will also be important for long-term success.



## CAREER SPOTLIGHT:

Dawson M. - Security Engineer I for ProCircular (Coralville, IA)

**“Computers and technology have always been a fascination for me. I started a computer club at my small, rural high school that turned into a cybersecurity club when we participated in Iowa State University’s cyber defense competition. It is an adrenaline pumper when you first start seeing real hackers attack your network. After participating in the competitions, it made me realize how exciting it would be to do something that in most instances would be illegal but, in this case, is legal since you have been granted permission to break into organizations. I often compare it to Mission Impossible, except here you have to document your process. In both the attack and defense sides of cybersecurity, you get to think outside the box, learn new techniques, and most of all have fun!”**





<p><b>DIRECTOR OF QUALITY ASSURANCE</b></p> <hr/> <p>Bachelor's Degree</p> <hr/> <p><b>\$26 - \$52/hr</b></p>	<p><b>SECURITY ADMINISTRATOR</b></p> <hr/> <p>Bachelor's Degree</p> <hr/> <p><b>\$39 - \$72/hr</b></p>	<p><b>DIRECTOR OF RISK MANAGEMENT</b></p> <hr/> <p>Bachelor's Degree</p> <hr/> <p><b>\$28 - \$61/hr</b></p>
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SENIOR  
LEVEL

ADDITIONAL  
EXPERIENCE  
& TRAINING

<p><b>QUALITY ASSURANCE ANALYST</b></p> <hr/> <p>Bachelor's Degree</p> <hr/> <p><b>\$19 - \$32/hr</b></p>	<p><b>SECURITY ENGINEER</b></p> <hr/> <p>Bachelor's Degree</p> <hr/> <p><b>\$23 - \$47/hr</b></p>	<p><b>DISASTER RECOVERY/ CONTINUITY SPECIALIST</b></p> <hr/> <p>Bachelor's Degree</p> <hr/> <p><b>\$18 - \$40/hr</b></p>
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MID  
LEVEL

ADDITIONAL  
EXPERIENCE  
& TRAINING

<p><b>QUALITY ASSURANCE TECHNICIAN</b></p> <hr/> <p>Associate's Degree</p> <hr/> <p><b>\$17 - \$28/hr</b></p>	<p><b>INFORMATION SECURITY ANALYST</b></p> <hr/> <p>Associate's Degree</p> <hr/> <p><b>\$18 - \$38/hr</b></p>	<p><b>MECHANICAL/ ENGINEERING TECHNICIAN</b></p> <hr/> <p>Technical Certificate/ Diploma</p> <hr/> <p><b>\$17 - \$26/hr</b></p>	<p><b>SECURITY OFFICER</b></p> <hr/> <p>High School/HSED</p> <hr/> <p><b>\$12 - \$22/hr</b></p>
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ENTRY  
LEVEL



## SECURITY OFFICER

ENTRY LEVEL

RCE - REALISTIC, CONVENTIONAL, ENTERPRISING

**Typical Education/Training:** High School Diploma/HSED

**Work Experience:** 0 - 3 years

**Wage Range:** \$12 - \$22/hour

Guard, patrol, or monitor products or premises to prevent theft, violence, or infractions of other rules, regulations, and laws. Monitor and authorize entrance and departure of employees, visitors, and other persons, including any associated materials, baggage, and other inventory or resources. Utilize metal detectors, security cameras, x-ray machines, and other surveillance technology and equipment. Collaborate with local law enforcement professionals.

**Knowledge & Skills:**

- 1) Public Safety & Security
- 2) Computers & Technology
- 3) Attention to Detail & Monitoring
- 4) Customer & Personal Service
- 5) Accurate Record & Time Keeping
- 6) Critical Thinking & Problem Solving



**Similar Roles/Titles:**

Security Guard, Security Agent, Security Management Specialist, Loss Prevention Officer, Site Security Specialist

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## MECHANICAL/ ENGINEERING TECHNICIAN

ENTRY LEVEL

CIR - CONVENTIONAL, INVESTIGATIVE, REALISTIC

**Typical Education/Training:** Technical Certificate/ Diploma

**Work Experience:** 0 - 3 years

**Wage Range:** \$17 - \$26/hour

Modify, develop, test, and calibrate computer hardware, machinery, and other equipment with various hand, diagnostic, mobile, and augmented or virtual reality tools and devices, generally under the direction of engineering staff or physical scientists. Read physical or digital dials, meters, and test sample data to determine safe, reliable, and efficient operating performance.

**Knowledge & Skills:**

- 1) Machine Maintenance & Repair
- 2) Attention to Detail & Inspection
- 3) Safety & Quality Control
- 4) Critical Thinking & Problem Solving
- 5) Basic Engineering & Technology
- 6) Mechanical, Digital, & Diagnostic Tools



**Similar Roles/Titles:**

Hardware Engineering Technician, Maintenance Technician, Tech Maintenance Specialist, Engineering Technical Analyst, Quality Engineering Technician

**Typical Work Environments:**

Tech, Manufacturing, Health Care, Energy, Transportation, Trades, Agriculture, Government, Media, Education, Retail, Non-Profit

## QUALITY ASSURANCE TECHNICIAN

ENTRY LEVEL

RIC - REALISTIC, INVESTIGATIVE, CONVENTIONAL

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$17 - \$28/hour

Work with hardware, software, and other designers, developers, engineers, analysts, and service or repair professionals to ensure high levels of quality, reliability, and safety at all times for associated products and services. Utilize various programs, tools, and other technology to conduct tests, identify concerns, document issues, and provide recommendations when appropriate for improvements, repairs, or service needs.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Basic Programming & Development
- 3) Inspection & Attention to Detail
- 4) Math & Engineering
- 5) Critical Thinking & Problem Solving
- 6) Communication & Record Keeping



**Similar Roles/Titles:**

Quality Testing Specialist, Quality Control Technician, QA Specialist, Quality Engineering Technician, Test Technician

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment



## INFORMATION SECURITY ANALYST

ENTRY LEVEL

CIA - CONVENTIONAL, INVESTIGATIVE, ARTISTIC

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$18 - \$38/hour

Monitor, inspect, test, and protect computer networks, databases, and other related technologies, systems, or sources of information against security breaches, viruses, and other spyware, phishing, or data hostage scenarios. Utilize a combination of technical programs, digital forensics, or software tools and an understanding of psychology, social engineering, and other human factors to provide full security support and guidance to address increasingly complex physical and cyber security threats.

**Knowledge & Skills:**

- 1) Inspection & Attention to Detail
- 2) Computers & Technology
- 3) Critical Thinking & Problem Solving
- 4) Psychology & Sociology
- 5) Analytical, Test, & Scientific Software
- 6) Data Collection & Analysis



**Similar Roles/Titles:**

Cybersecurity Analyst, Information Security Officer, Information Security Specialist, IT Security Analyst, Security Analyst

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## QUALITY ASSURANCE ANALYST

MID LEVEL

CIR - CONVENTIONAL, INVESTIGATIVE, REALISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$19 - \$32/hour

Review, evaluate, and recommend changes to products or processes in order to achieve a high level of product or service quality, reliability, and safety. Conduct routine and on-the-spot analysis of raw materials or code, draft or beta-test samples, and finished products or services. Monitor physical, environmental, digital, and other trends or factors to forecast and resolve any issues in coordination with design, development, and other teams.

**Knowledge & Skills:**

- 1) Data Analysis & Record Keeping
- 2) Mathematics & Measuring
- 3) Critical Thinking & Problem Solving
- 4) Advanced Computers & Technology
- 5) Inspection & Attention to Detail
- 6) Safety & Quality Control



**Similar Roles/Titles:**

Test Analyst, Quality Engineer, Quality Control Technician, Test Engineer, Lead Tester

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## DISASTER RECOVERY/ CONTINUITY SPECIALIST

MID LEVEL

EIC - ENTERPRISING, INVESTIGATIVE, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$18 - \$40/hour

Develop, document, maintain, and coordinate business continuity and disaster recovery strategies and solutions, including risk assessment, business impact analysis, and related responses or procedures. Plan, conduct, and analyze results of regular mock-disaster or system breach exercises to test existing plans and strategies. Update procedures and plans regularly and provide recommendations for staff training or technology improvement needs.

**Knowledge & Skills:**

- 1) Leadership & Management
- 2) Data Management & Analysis
- 3) Crisis & Emergency Planning
- 4) Computers & Technology
- 5) Communication & Coordination
- 6) Critical Thinking & Decision Making

**Similar Roles/Titles:**

Business Continuity Analyst, Disaster Recovery Consultant, Business Continuity Consultant, Data Recovery Planner, Enterprise Resiliency Manager

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment



## SECURITY ENGINEER

MID LEVEL

CIA - CONVENTIONAL, INVESTIGATIVE, ARTISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$23 - \$47/hour

Plan, implement, upgrade, or monitor security measures for the protection of computer networks, databases, and other related technologies, systems, or sources of information. Inspect and test security systems, firewalls, and other measures to ensure security controls are in place and working correctly to protect digital files, information, and vital electronic infrastructure. Quickly and efficiently respond to computer security breaches, viruses, and other spyware, phishing, or data compromise scenarios.

**Knowledge & Skills:**

- 1) Database Management & Networking
- 2) Computers & Telecommunications
- 3) Inspection & Attention to Detail
- 4) Critical Thinking & Problem Solving
- 5) Analytical, Test, & Scientific Software
- 6) Data Collection & Analysis

**Similar Roles/Titles:**

System Security Engineer, IT Security Manager, Senior Security Analyst, Lead Cybersecurity Analyst, Firewall Engineer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## DIRECTOR OF QUALITY ASSURANCE

SENIOR LEVEL

CER - CONVENTIONAL, ENTERPRISING, REALISTIC

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$26 - \$52/hour

Plan, direct, and coordinate the activities of an organization to ensure compliance with safety, regulatory, and quality standards throughout the entire design, development, launch, and management process of products, services, and associated or related technologies, equipment, or systems. Oversee the department of quality assurance, related training, and coordination with other departments.

**Knowledge & Skills:**

- 1) Advanced Data Management & Analysis
- 2) Advanced Computer Programs & Technology
- 3) Management & Leadership
- 4) Accounting & Finance
- 5) Quality & Safety Control
- 6) Compliance & Regulatory Affairs

**Similar Roles/Titles:**

Director of Quality, Quality Assurance Manager, Quality Control Manager, Director of Compliance, Compliance Officer

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## DIRECTOR OF RISK MANAGEMENT

SENIOR LEVEL

SEC - SOCIAL, ENTERPRISING, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$28 - \$61/hour

Plan, direct, and coordinate the activities of an organization to ensure the appropriate planning, response, and control of various physical and digital risk factors, such as natural disasters, system hacking, supply chain shortages, and other planned or random disruptions in power, communications, and related or interconnected networks, products and services. Oversee the security and quality assurance teams, related training, and coordination with other departments.

**Knowledge & Skills:**

- 1) Leadership & Management
- 2) Advanced Data Management & Analysis
- 3) Crisis & Emergency Planning
- 4) Advanced Computers & Technology
- 5) Communication & Coordination
- 6) Complex Critical Thinking & Problem Solving

**Similar Roles/Titles:**

Emergency Management Coordinator, Crisis Response Director, Hazard Mitigation Officer, Occupational Risk Director, Director of Business Continuity

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit



## SECURITY ADMINISTRATOR

### SENIOR LEVEL

IRC - INVESTIGATIVE, REALISTIC, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$39 - \$72/hour

Oversee the purchase, installation, testing, and management of an organization's IT security systems, personnel, and solution strategies. Stay updated on news, trends, and security threats to ensure the continued safety, integrity, and reliability of information, networks, systems, and related programs, applications, or products and services. Collaborate with other department heads to develop security policies and training programs to ensure all staff are aware of and practicing safe data handling, communication, and general working habits.

**Knowledge & Skills:**

- 1) Advanced Security & Data Management
- 2) Leadership & Management
- 3) Crisis & Emergency Planning
- 4) Advanced Computers & Technology
- 5) Psychology & Social Engineering
- 6) Complex Critical Thinking & Problem Solving

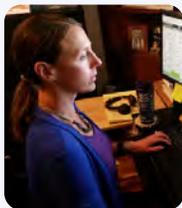
**Similar Roles/Titles:**

Security Director, Information Security Manager, Network Security Manager, Security Architect, Director of Cybersecurity

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## PROFESSIONALS IN IT SPOTLIGHT:



**Jen H. - Compliance Reporting Manager for Kirkwood Community College (Cedar Rapids, IA)**

"I've spent most of my career as an audit and compliance professional. Although I've always worked with data, it wasn't until my current role at Kirkwood that I realized I'm also a data specialist. I really enjoy working with people across all functions, helping all of us to learn and grow through data. It's even more fun when I get to be creative in finding new and different ways to share information."





Professionals from the *Sales & Client Relations* family seal the deal! They market, sell, and manage a wide range of products, services, and relationships to keep the business running smoothly and profitable so that everyone continues to work and get paid.

Simply having a great application, game, device, or other products and services isn't enough to be successful if no one is aware of or wants to purchase it. These professionals work directly with customers, clients, or end users to provide education or training, resolve complaints or issues, and promote new or improved products and services to ensure customer satisfaction and long-term success. Advances in telecommunications, cloud computing, and the mixing of our physical and digital identifies will continue to change how important client or customer relationships are managed and many of these occupations are practiced.

Many of these occupations will require advanced education or training in addition to a high school diploma or equivalent. Experience in the industry may serve as a replacement, however, to help professionals "speak the language" when selling or consulting on projects. Experience with social media and digital communications tools is often a must as client and customer relationship management preferences change in a digital or virtual environment. An added perk for some of these occupations is that they may include the opportunity for increased wages through commissions based on sales performance or service level agreements, allowing workers to make substantially more than their base pay.

Someone who works well with others, has a competitive side, and doesn't mind the uncertainty of interacting with potentially angry customers will do well in these roles. They often work behind the scenes to ensure customers are happy and more likely to return for future business or refer others.



## CAREER SPOTLIGHT:

Louis M. - IT Intern/Systems Support Analyst for Ruan Transportation Management Systems (Des Moines)

**"I first learned about IT jobs from a cool DMACC flyer that showed IT professionals as superheroes with different powers and abilities. I liked that idea of developing a set of powers to solve problems in IT. I jumped at an opportunity to dual enroll at DMACC to learn some of these skills while still in high school. I now work at a call center where I come across anything and everything and provide the first level of troubleshooting and incident documentation. I've learned so much that I can solve over two-thirds of the problems I come across on the same call! I like that it never gets boring because you never know what you're going to get when you pick up the phone. I plan to continue my studies and get into corporate ethics and compliance to help companies make better decisions. I'd recommend finding an internship or other option to test out a career in IT. There are lots of great resources and opportunities here in Iowa."**

# **RUAN**



# SALES & CLIENT RELATIONS

# THE CLOSERS



## CUSTOMER SERVICE REPRESENTATIVE

ENTRY LEVEL

ESC - ENTERPRISING, SOCIAL, CONVENTIONAL

**Typical Education/Training:** High School Diploma/HSED

**Work Experience:** 0 - 3 years

**Wage Range:** \$13 - \$25/hour

Interact with customers by phone, email, online, and in person to provide information in response to inquiries about products and services. Handle, record, and resolve complaints when necessary, weighing the needs of the customer and the company for long term growth and success. May provide recommendations for new or improved product and service offerings.

**Knowledge & Skills:**

- 1) Customer & Personal Service
- 2) Critical Thinking & Problem Solving
- 3) Sales & Negotiation
- 4) Communication & Social Media Tool
- 5) Active Listening & Understanding
- 6) Conflict Management & Resolution



**Similar Roles/Titles:**

Customer Service Agent, Customer Care Representative, Customer Service Specialist, Member Services Representative, User Assistance Agent

**Typical Project Types:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## HELP DESK TECHNICIAN

ENTRY LEVEL

RIC - REALISTIC, INVESTIGATIVE, CONVENTIONAL

**Typical Education/Training:** Technical Certificate/ Diploma

**Work Experience:** 0 - 3 years

**Wage Range:** \$14 - \$27/hour

Answer questions, resolve issues, and provide other types of technical assistance to computer, service, or technology users by phone, email, chat, and other electronic or remote assistance technologies. May provide general assistance concerning the use of computer hardware and software or specialize in specific technologies, applications, or services. Maintain accurate records of support or service requests and provide recommendations when necessary for equipment and training needs.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Written & Oral Communication
- 3) Project & Time Management
- 4) Customer & Personal Service
- 5) Critical Thinking & Problem Solving
- 6) Conflict Resolution & Record Keeping



**Similar Roles/Titles:**

Help Desk Analyst, Computer Support Specialist, Remote Assistance Support, Tech Support, IT Generalist

**Typical Project Types:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## TRAINING & DEVELOPMENT SPECIALIST

ENTRY LEVEL

RIC - REALISTIC, INVESTIGATIVE, CONVENTIONAL

**Typical Education/Training:** High School Diploma/HSED

**Work Experience:** 0 - 3 years

**Wage Range:** \$14 - \$34/hour

Design, schedule, and conduct technical training and professional development programs in-person and by phone, webinar, virtual reality, or other live and pre-recorded methods. May focus on the explanation, use, or benefits of specific technologies, services, and equipment or provide general support and guidance to improve individual or organizational performance. Research, observe, and provide recommendations for improvements to training, resources, and equipment.

**Knowledge & Skills:**

- 1) Education & Training
- 2) Computers & Technology
- 3) Communication & Conflict Resolution
- 4) Customer & Personal Service
- 5) Critical Thinking & Problem Solving
- 6) Sales & Negotiation

**Similar Roles/Titles:**

Corporate Trainer, Training Facilitator, Technology Training Specialist, Professional Development Specialist, Technology Educator

**Typical Project Types:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

# SALES & CLIENT RELATIONS

# THE CLOSERS



## DESKSIDE SUPPORT TECHNICIAN

ENTRY LEVEL

RIC - REALISTIC, INVESTIGATIVE, CONVENTIONAL

**Typical Education/Training:** Associate's Degree

**Work Experience:** 0 - 3 years

**Wage Range:** \$16 - \$28/hour

Answer questions, resolve issues, and provide in-person installation, usage, and other technical assistance to staff and other computer, service, or technology users within an organization. Provide support by phone, email, chat, and other electronic or remote assistance technologies if unable or not necessary to respond in-person. Maintain accurate records of support or service requests and provide recommendations when necessary for equipment and training needs.

**Knowledge & Skills:**

- 1) Computers & Technology
- 2) Written & Oral Communication
- 3) Customer & Personal Service
- 4) Critical Thinking & Problem Solving
- 5) Conflict Resolution & Record Keeping
- 6) Project & Time Management



**Similar Roles/Titles:**

Tech Support, Computer Support Specialist, Desktop Support Specialist, Office Support Specialist, IT Generalist

**Typical Project Types:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## SALES REPRESENTATIVE

ENTRY LEVEL

ESC - ENTERPRISING, SOCIAL, CONVENTIONAL

**Typical Education/Training:** High School Diploma/HSED

**Work Experience:** 0 - 3 years

**Wage Range:** \$17 - \$34/hour + Commission

Identify the needs of current and potential customers through direct and indirect interaction and research. Match customer needs with product or service offerings, negotiate sales, and train customers to operate, manage, or maintain services or technology and related supplies, materials, or equipment. Estimate or quote prices, credit or contract terms, and service level agreements or timelines. Opportunity for increased wages through commissions based on sales performance.

**Knowledge & Skills:**

- 1) Sales & Negotiation
- 2) Social Media & Marketing
- 3) Customer & Personal Service
- 4) Computers & Technology
- 5) Critical Thinking & Problem Solving
- 6) Communication & Relationship Management



**Similar Roles/Titles:**

Sales Associate, Outside Sales, Inside Sales, Service Representative, Tech Sales Specialist

**Typical Project Types:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## DIGITAL MARKETING SPECIALIST

MID LEVEL

IEC - INVESTIGATIVE, ENTERPRISING, CONVENTIONAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$16 - \$34/hour

Research market conditions and gather information to determine sales potential for technology products or services in digital environments or designated physical sales regions or areas. Measure the effectiveness of marketing, advertising, and communications programs and strategies, including social media, search engine optimization, and other digital tools or strategies. Collect and analyze data on competition, customer base, and advances in technology.

**Knowledge & Skills:**

- 1) Research, Data, & Analytics
- 2) Customer & Personal Service
- 3) Critical Thinking & Problem Solving
- 4) Sales & Marketing
- 5) Social Media & Communication Tool
- 6) Computers & Technology



**Similar Roles/Titles:**

Marketing Analyst, Communications Specialist, Market Research Analyst, Social Media Specialist, Search Marketing Strategist

**Typical Project Types:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment



## SOLUTIONS & SUPPORT ANALYST

MID LEVEL

CEI - CONVENTIONAL, ENTERPRISING, INVESTIGATIVE

**Typical Education/Training:** Associate's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$17 - \$30/hour

Monitor, advise, and assist with the technical and development support needs of a company and its customers. May supervise or assist help desk, deskside, or other support staff with more advanced problems, complaints, or technical and support needs. Monitor support or service request trends, research potential causes, and provide recommendations for performance, technology, or staffing improvements and solutions.

**Knowledge & Skills:**

- 1) Project & Time Management
- 2) Computers & Technology
- 3) Research & Data Analysis
- 4) Customer & Personal Service
- 5) Critical Thinking & Problem Solving
- 6) Communication & Negotiation

**Similar Roles/Titles:**

Technology Support Supervisor, IT Support Assistant, Tech Support Lead, Office Technology Consultant, Solutions Strategist

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## SERVICE/ ACCOUNT MANAGER

MID LEVEL

CES - CONVENTIONAL, ENTERPRISING, SOCIAL

**Typical Education/Training:** High School Diploma/HSED

**Work Experience:** 4 - 7 years

**Wage Range:** \$20 - \$30/hour

Serve as the connection between internal product, project, and other management or support staff and external customers for administrative or technical support service needs, such as reviewing account projects or goals, monitoring service or repair needs, and building or strengthening important customer relationships. Identify trends, research solutions, and provide recommendations to ensure both customer satisfaction and long-term company success.

**Knowledge & Skills:**

- 1) Account & Project Management
- 2) Sales & Negotiation
- 3) Computers & Technology
- 4) Communication & Team Coordination
- 5) Critical Thinking & Problem Solving
- 6) Customer & Personal Service

**Similar Roles/Titles:**

Account Coordinator, Service Advisor, Client Relations Manager, Client Relationship Manager, Client Facing Advisor

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit

## CUSTOMER SERVICE SUPERVISOR

MID LEVEL

ECS - ENTERPRISING, CONVENTIONAL, SOCIAL

**Typical Education/Training:** Associate's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$22 - \$34/hour

Plan, direct, and coordinate the activities of customer service agents and representatives of the organization who answer questions, address complaints, and may handle billing for customers. Handle complex or elevated cases and customer complaints. Monitor trends in product or service requests, identify common problems or complaints, and provide updates or recommendations for related solutions.

**Knowledge & Skills:**

- 1) Management & Leadership
- 2) Customer & Personal Service
- 3) Project & Time Management
- 4) Advanced Conflict Management & Resolution
- 5) Critical Thinking & Problem Solving
- 6) Computers and Technology

**Similar Roles/Titles:**

Administrative Supervisor, Office Supervisor, Client Facing Supervisor, Customer Service Lead, Shift Manager

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit



## SALES ENGINEER

### MID LEVEL

ERS - ENTERPRISING, REALISTIC, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 4 - 7 years

**Wage Range:** \$31 - \$52/hour + Commission

Sell products requiring extensive technical expertise and support for installation and use, such as virtual or augmented reality, specialized database or information storage, and advanced computer or networking systems. Prepare and deliver technical presentations that explain products or services to customers, sometimes at work sites, trade shows, and on live production floors. May include opportunity for increased wages through commissions based on sales performance.

**Knowledge & Skills:**

- 1) Design, Drafting, & Technical Software
- 2) Sales & Negotiation
- 3) Social Media & Digital Marketing
- 4) Advanced Technology & Computer Systems
- 5) Communication & Data Analysis
- 6) Critical Thinking & Problem Solving

**Similar Roles/Titles:**

Senior Sales Representative, Technical Sales Lead, Solutions Analyst, Product Sales Engineer, Account Executive

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## SOLUTIONS ARCHITECT

### SENIOR LEVEL

ECS - ENTERPRISING, CONVENTIONAL, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$28 - \$47/hour

Plan, develop, and coordinate client relationship and solution management policies and programs, such as determining product demand and competitive market analysis. Develop pricing strategies with the goal of maximizing profits or share of the market while ensuring customer satisfaction. Advise product development or monitor trends that indicate the need for new or improved products, technologies, and services.

**Knowledge & Skills:**

- 1) Sales & Negotiation
- 2) Management & Leadership
- 3) Communication & Coordination
- 4) Computers & Technology
- 5) Market Research & Analytics
- 6) Social Media & Digital Marketing Tools

**Similar Roles/Titles:**

Director of Brand Management, Client Relations Manager, Business Solutions Developer, Marketing Manager, Director of Business Solutions

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## CUSTOMER SERVICE MANAGER

### SENIOR LEVEL

ECS - ENTERPRISING, CONVENTIONAL, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$26 - \$43/hour

Oversee the management and coordination of all customer service agents, administrative staff, and other employees who interact directly or indirectly with customers. Monitor customer trends, review and negotiate contracts or service level agreements, and enact staffing, training, or budgetary solutions to ensure long-term organizational success and growth.

**Knowledge & Skills:**

- 1) Management & Leadership
- 2) Advanced Customer & Personal Service
- 3) Contracts, Budgets, & Financial Models
- 4) Communication & Human Resources
- 5) Complex Critical Thinking & Problem Solving
- 6) Sales & Marketing

**Similar Roles/Titles:**

Customer Service Coordinator, Customer Service Director, Client Facing Manager, Administrative Officer, Business Administrator

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit



## SALES MANAGER

## SENIOR LEVEL

## ECS - ENTERPRISING, CONVENTIONAL, SOCIAL

**Typical Education/Training:** Bachelor's Degree

**Work Experience:** 8+ years

**Wage Range:** \$29 - \$56/hour + Commission

Plan, direct, and coordinate sales activities, goals, and strategies, including the establishment of associated training programs for sales, service, and support staff. Analyze sales statistics, market intelligence data, and product or service requests to determine variables such as sales potential, inventory or service requirements, and changing customer preferences or regulatory and political considerations.

**Knowledge & Skills:**

- 1) Management & Leadership
- 2) Sales & Negotiation
- 3) Contracts, Budgets, & Financial Models
- 4) Market Research & Data Analysis
- 5) Complex Critical Thinking & Problem Solving
- 6) Social Media & Communication

**Similar Roles/Titles:**

National Sales Manager, Regional Sales Manager, Sales and Marketing Vice President, Sales Director, Client Solutions Manager

**Typical Work Environments:**

Tech, Manufacturing, Finance, Health Care, Energy, Transportation, Trades, Agriculture, Entertainment, Government, Safety, Media, Education, Retail, Non-Profit, Self-Employment

## PROFESSIONALS IN IT SPOTLIGHT:



**Marc S. - Supervisor, IT Customer Support for UnityPoint Health (Cedar Rapids, IA)**

"I love the Information Technology field because things are always changing and evolving, which requires everyone to learn new software, hardware, tools, or resources daily. People don't always think of IT and healthcare together, but the amount of technology in a healthcare facility is astounding. I have worked in IT for 17 years and it has completely changed healthcare and how patient care is provided. Our team handles all incoming calls, emails, and self-service inquiries and could potentially troubleshoot issues regarding any piece of equipment that plugs into a wall within a healthcare facility. As a Supervisor, we train staff to be analytical, resourceful, and technologically efficient so our patient care staff can hold a patient's hand rather than a mouse."



**UnityPoint Health**

## ADDITIONAL CAREER OPTIONS - THERE IS A CAREER FOR EVERYONE IN INFORMATION TECHNOLOGY!

Don't see a career you like? This document is not meant to cover every possible career option in this industry in Iowa, so don't worry if you don't see something that immediately grabs your attention or seems to match your career interest type. There are a wide range of additional career options available that are necessary for all types of businesses, regardless of industry, size, or location. Below are just a few examples of where you might also fit within this exciting and fulfilling industry.

- ▶ **ADMINISTRATIVE AND HUMAN RESOURCES** – Those in charge of overseeing various aspects of employment for a company, such as recruitment, employee benefits, and compliance with labor laws.  
**HIRING MANAGERS, BENEFITS COORDINATORS, ADMINISTRATIVE ASSISTANTS, PAYROLL ADMINISTRATORS, AND RECRUITERS.**
- ▶ **BUSINESS AND FINANCIAL SERVICES** – A group of support careers that assist in the day-to-day operations of a successful company, such as keeping track of finances, monitoring government regulations, and administrative support to other departments.  
**ACCOUNTANTS, FINANCIAL ANALYSTS, INSURANCE AGENTS, FINANCIAL ADVISORS, AND SUPPORT CLERKS.**
- ▶ **SKILLED AND MECHANICAL TRADES** – Buildings and facilities take a lot of time and work to maintain, so companies sometimes employ specialized workers or contractors to keep a facility properly maintained and running smoothly, in addition to leading any expansion efforts.  
**PLUMBERS, ELECTRICIANS, HEATING AND AIR CONDITION TECHNICIANS, CONSTRUCTION WORKERS, AND INDUSTRIAL PAINTERS.**
- ▶ **SUPPLY CHAIN AND RESOURCE MANAGEMENT** – Every company needs a consistent supply of power, materials, office supplies, and other resources to be successful. A team of dedicated and trained professionals is needed to accurately and efficiently forecast, order, inventory, and distribute these essential supplies to keep everyone else working and efficient.  
**SHIPPING & RECEIVING CLERKS, WAREHOUSE MANAGERS, PROCUREMENT AUDITORS, AND COMPLIANCE MANAGERS.**
- ▶ **EXECUTIVE MANAGEMENT** – A team of individuals at the highest level of management of an organization who oversee the mission, vision, and general tasks of managing an organization.  
**PRESIDENTS, VICE PRESIDENTS, CHIEF OPERATIONS OFFICERS (COO), CHIEF INFORMATION OFFICERS (CIO), AND CHIEF EXECUTIVE OFFICERS (CEO).**



## NEXT STEPS & PLANNING RECOMMENDATIONS

This document was meant to begin the conversation about the great career opportunities available in information technology in Iowa. Below are some additional recommendations for next steps readers can take to continue their career exploration journey. Utilize the basic career exploration plan and notes sections on the next few pages to begin putting thought into action. Links have been provided to help guide readers to additional online resources.

### STUDENTS AND JOB SEEKERS

- **FUTURE READY IOWA CAREER COACH** – The free interactive Career Coach tool at [FutureReadyIowa.gov](https://FutureReadyIowa.gov) is a great way for students and job seekers of all ages to learn more about their career interests and research specific occupations, including the ability to customize labor market information, education offerings, and employer listings to their specific geographic location. The new [Clearinghouse for Work-Based Learning](#) also allows students to tackle projects to learn more about different industries and gain real-world experience, regardless of where they are located in Iowa.
- **HANDS-ON EXPERIENCE & VOLUNTEERING** – Contact an employer directly to ask questions, learn about current openings, and request either a site tour or job shadow opportunity for a better idea of what it would be like to work for them. Internships and volunteering are also great opportunities to earn experience, build up a resume, and test out a career before making any long-term and expensive career decisions. Consult with counselors, educators, and the [Iowa Intermediary Network](#) for local opportunities or visit [VolunteerIowa.org](https://VolunteerIowa.org) to search for additional openings. Also consider starting or joining a local chapter of student organizations like [Business Professionals of America \(BPA\)](#), [Future Business Leaders of America/Phi Beta Lambda \(FBLA/PBL\)](#), or the [Iowa Cyber Hub](#) to meet employers, gain industry skills, build lasting friendships, and compete in statewide and national challenge events.
- **EARN SKILLS AND CERTIFICATIONS** – Many careers in this industry will rely on some foundational skills and certifications that can be earned relatively easily and affordably by students and job seekers proactively before entering the workforce. Some schools even have dual-enrollment or pre-apprenticeship agreements that allow students to earn college credit, apprenticeship technical requirements, and even full industry certifications before graduating. Having these skills, experience, and certifications will increase your chances of landing a great job compared to others who have not taken any such action to improve themselves.

### EMPLOYERS, EDUCATORS, AND COMMUNITY SUPPORT PARTNERS

- **WORK-BASED LEARNING INTERMEDIARY NETWORK** – The Iowa Intermediary Network is made up of 15 regional networks that serve as a single one-stop point of contact by connecting businesses and schools with work-based learning opportunities. These can include job shadows, internships, site tours, guest speakers, and educator externships. Contact your regional [Intermediary](#) and access the [Work-Based Learning Guide](#) to learn more about setting up a successful local work-based learning experience. With adult supervision and appropriate privacy and safety measures, youth under the age of 18 can work in this industry.
- **IOWA STEM TEACHER EXTERNSHIPS** – Teachers across Iowa have the opportunity to take advantage of an externship program, where during the summer, they work side-by-side with knowledgeable and skilled industry professionals who help bring the classroom curriculum to life. Teacher Externships are full-time, six-week temporary summer positions in local businesses and agencies for secondary STEM educators. Teachers earn a stipend of up to \$5,000 (including two days of professional development), as well as three graduate credits through the University of Northern Iowa's Continuing Education program. Teacher Externships provide educators with the exposure to answer questions about real-world application, prepare students for careers they may have in the future, and improve educational experiences. Visit [IowaSTEM.gov/externships](https://IowaSTEM.gov/externships) to learn more and apply for these great opportunities.
- **INDUSTRY SECTOR PARTNERSHIPS AND BOARDS** – Employers, educators, and other community support partners can take a more active role in training and developing their local workforce by meeting to collaborate on local education, economic, and community issues. These employer-led groups are often referred to as sector partnerships or sector boards. There are currently over 60 of them spread throughout Iowa, with a growing number devoted exclusively to various aspects of information technology and skilled tech roles. More information, group locations, contact information, and resources can be found at [SectorPartnerships.EducateIowa.gov](https://SectorPartnerships.EducateIowa.gov).

## MY CAREER EXPLORATION ACTION PLAN

Use the following template to create a career exploration action plan for taking the next steps towards a fun, exciting, and fulfilling tech career in Iowa!

	<b>What is the goal?</b>	<b>Who is involved?</b>	<b>How will it be completed?</b>	<b>Where will it be completed?</b>	<b>When will it be completed?</b>
<b>Goal Example</b>	I want to actually see what its like to be an App Developer.	Me, my teacher, my parents, and an App Developer.	I will watch videos online and call a local software company or consultant to set up a job shadow opportunity to sit with and observe an App Developer at work.	Online and in-person at a local training center, coding camp, or job site.	Summer 2023
<b>Goal #1</b>					
<b>Goal #2</b>					
<b>Goal #3</b>					
<b>Goal #4</b>					





**COMMUNITY COLLEGES &  
WORKFORCE PREPARATION**  
*PROSPERITY THROUGH EDUCATION*

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