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ANNUAL ROUNDUP

career ROADMAP

Great tech careers don't happen overnight. These seven success stories show you how to follow the path to your dream job.

INSIDE

What it takes to be a...

2 Marketing executive

4 Mobile developer

7 Data scientist

10 Technology evangelist

12 Research scientist

14 DevOps engineer

17 Sysadmin

The evolution of a marketing executive

What does it take to prepare for, land and succeed in the hottest roles in IT? This month, we look at how Kristine Spence climbed the digital marketing ladder.

BY SHARON FLORENTINE

Kristine Spence didn't set out to pursue a career in digital marketing. In fact, when she entered the job market, the term didn't even exist. The role emerged with the rise of the Web and digital media, and it has been evolving in step with the ongoing advances in technology ever since. And Spence's career keeps evolving right along with it.

Spence graduated from Florida International University with a degree in hospitality management and began her career handling day-to-day management for a Walt Disney World resort restaurant group. When the opportunity arose to move into a sales and marketing coordination role for a luxury restaurant group, she jumped at the chance.

As she took advantage of new opportunities, she found herself learning new skills. "I had taken the required marketing courses for my degree,



Digital Marketing

ROLES	Content marketing manager, social media marketing manager, marketing account manager, director of marketing
MINIMUM EDUCATION	Bachelor's degree or several years of experience in relevant roles
RELEVANT AREAS OF STUDY	Communications, analytics, statistics, sales, economics
TECHNOLOGY SKILLS	Google AdWords, SEO platforms like Google Analytics or Adobe Catalyst, SEM best practices, Marketo and Salesforce.com
POTENTIAL EMPLOYERS	Organizations of all sizes, PR/advertising/marketing agencies
SALARY	\$51,300 National median pay

but at that point, ‘digital marketing’ didn’t exist,” Spence says. “But in the mid-1990s, every aspect of sales and marketing began to move away from print and toward online, digital media. I had a solid background, but I had to learn as I went — everything from email marketing, search marketing, Google ads and Adwords, banner advertisements, pop-up ads, building links.”

IT-marketing liaison

From there, Spence served as an executive assistant to the American Hotel and Lodging Educational Institute’s CEO, senior vice president and executive vice president of marketing. She parlayed her success as a liaison between sales, marketing and IT into a promotion



“I’ve kept pushing myself to master the technical aspects by working closely with IT.”

—KRISTINE SPENCE

to senior director of marketing for the institute in 2010.

Since then, Spence has driven successful social media, email and SEO/SEM campaigns, and she has worked to enhance the nonprofit’s Web presence and Internet traffic.

“All of my previous positions have touched on aspects of marketing. Within that, I’ve kept pushing myself to master the technical aspects by working closely with IT and our content marketing specialists to maximize

our site through SEO, and really understand the digital space,” Spence says.

Demand skyrockets

Demand for digital marketing professionals like Spence has skyrocketed as technology keeps evolving, says Chris Taylor, director of executive search at staffing firm Onward Search. But demand for certain specialties within the field has shifted, he adds.

Five years ago, most of Onward’s clients were looking for people with SEO and paid search expe-

rience, Taylor says. With changes to search engine algorithms, though, that demand has leveled off in the past year or so, and companies are looking more for people with social media expertise and for candidates with experience crafting content for paid search.

“It’s really hard to find this talent,” Taylor says. “The digital marketing people who are currently employed are getting tons of emails every day from employers trying to poach them — even if they’ve only

been in their roles a few months, because the market is so strapped.”

Spence’s goal is to stay relevant in an evolving discipline.

“I do a lot of research, I attend industry seminars and webinars, I network with other professionals, I read articles,” she says. “But most of this I’ve learned by doing and by ‘blowing stuff up’ — and that’s the fun and exciting part.” ♦

Sharon Florentine is a senior writer at CIO.com.

How a mobile developer found his calling

What does it take to prepare for, land and succeed in the hottest roles in IT? This month, we look at how Chris Turner pivoted a successful Web development career for the 'mobile first' era.

BY SHARON FLORENTINE

Programming didn't come naturally for Chris Turner. He planned to focus on engineering when he entered Lock Haven University in Lock Haven, Pa.

"I had no idea what I wanted to do. I took a Programming 101 class, and that really clicked for me — but it was extremely difficult. The only experience I had with computers was AOL Messenger. Everyone else was talking about how they'd coded on their Commodore 64, and I was literally starting from nothing. I had to work twice as hard as everyone else in the class to understand the concepts and the practices, and I ended up neglecting my other courses," Turner says.

After a lackluster first year, he dropped out.

In the early 2000s, after a stint at a technical trade school at a time when jobs were scarce as a result of the dot-com bust, Turner returned to Lock Haven and declared a major in computer information systems (CIS), which



Mobile Developer

ROLES	Mobile developer, application developer, Web developer, UI developer/designer, UX designer/developer
MINIMUM EDUCATION	None – can be self-taught, though formal education is recommended
RELEVANT AREAS OF STUDY	Math, science, engineering, communications, art, design, psychology
TECHNOLOGY SKILLS	iOS, Android, JavaScript, HTML, Web scripting
POTENTIAL EMPLOYERS	Organizations of all sizes, independent contractors
NATIONAL MEDIAN SALARY	\$77,400

not only emphasized hard technology skills, theory and practice, but also incorporated business, economics and communication skills.

On-the-job training

While working as a Web developer at an insurance company, Turner met one of his first mentors: Simon Horwith, an instructor and consultant who led a ColdFusion and Flex training program that Turner attended in Maryland. “[Horwith] was just fantastic; I learned so much from him about architecting solutions and consulting with clients,” Turner recalls. “I wanted to learn everything I could from him, so when he came to Lock Haven to help with a big insurance project, I took him out for a beer and



“I would find the smartest person in the room and pepper them with questions about how they were approaching problems.” —CHRIS TURNER

grilled him about everything he could teach me.”

That relationship led to Turner being offered a position at Horwith’s consulting company, where he spent a few years working on increasingly larger and more technically advanced Web development projects for government clients, including the National Institutes of Health.

“I started jumping on every project I could find that would teach me something new,” he says. “I would find the smartest person in the room and pepper them with ques-

tions about how they were approaching problems, why they used certain solutions to solve them. I could not get enough — I wanted to learn everything I possibly could.”

That persistence and willingness to learn paid off when Turner was named project lead for a large-scale Web development project for a Texas city. He admits that he was nervous about putting his skills to the test, especially because the project was on an almost-impossibly-tight deadline. But he buckled down and pulled

it off without a hitch.

“That was terrifying. But it was what I’d been working toward, and I had no choice but to jump in and do it,” Turner says. “We hit our deadlines, we rolled out the site — and they loved it.”

A new direction

After a move to Connecticut, Turner began dabbling in iOS development and landed a job at ESPN working on the sports media giant’s Sports Center application and the Tournament Challenge App. His background in

Web development and his knowledge of ActionScript and Flex translated well to mobile development. And while he was there, he embraced agile development, though he says it was less of a mindset shift than a matter of organizing best practices he'd learned over the years into a formal framework.

As a mobile developer at iDevices, a connected home application development company, Turner found himself working for the first time on an app without a server back end, which was a new and exciting experience.

"I also had the opportunity to work on our Apple Watch app, which started with supporting the iGrill application and has evolved into controlling any HomeKit products a

"I'm helping to design and capture the user experience through an interface. That's my absolute favorite part — to talk to users and figure out ... how they need technology to work" —CHRIS TURNER

user has. I'll never forget the thrill I had the first time I turned off my lights by tapping a button on my watch," he says.

Mobile is money

Mobile development is a hot specialty nowadays, and talented developers like Turner are in high demand. "Mobile is on the front lines of what companies are doing in development — the 'mobile first' strategy means that now everything is created for use and views on a mobile device first," says Michael Sage, chief evangelist at

BlazeMeter, which offers a self-service load-testing platform as a service.

When Sage searches for developers, he looks for people with a solid combination of technical and soft skills backed up by real-world, on-the-job examples of success. While he believes a four-year degree is important, he focuses more on evaluating the projects developers have worked on, and assessing their ability to work cross-functionally with people in other departments.

And Turner says that's the part of his job that

he likes best.

"What I do is really unique. I'm not only writing code for a back-end system, but I'm helping to design and capture the user experience through an interface," Turner says. "That's my absolute favorite part — to talk to users and figure out how they see things, how they need technology to work, and then thinking about how to make that beautiful, intuitive and seamless. It's amazing." ■

Sharon Florentine is a senior writer at CIO.com.

What it takes to be a data scientist

How do you land a job in one of today's hottest tech fields? We talk to two data scientists to find out.

BY SHARON FLORENTINE

Seemingly all of a sudden, data scientist has become one of the most high-profile careers in IT, and people with the skills to do the job are in demand. But many IT professionals have been quietly working behind the scenes in the field for years.

Take Tom Walsh and Alex Krowitz, for example. They're research engineers at cloud workforce management software company Kronos. "We both work in the workforce management and timekeeping division here at Kronos," says Walsh.

Describing the type of work they do, Walsh says, "There are generally two kinds of projects we regularly handle: Mining patterns within data to improve our own products is one, and the other is taking on specific sets of customer data to gather and deliver insights from that."



Data Scientist	
ROLES	Data scientist, business analyst, chief data officer, analytics manager, DevOps specialist
MINIMUM EDUCATION	Master's degree recommended
RELEVANT AREAS OF STUDY	Statistics, analytics, mathematics, computer science, engineering, physics
TECHNOLOGY SKILLS	Data analytics, algorithms, neural networks, machine learning, artificial intelligence
POTENTIAL EMPLOYERS	Academic institutions, health-care providers, PR/advertising/marketing agencies, research firms, technology companies, manufacturers, retailers.
SALARY	\$93,146 (National median)

What companies look for in a data scientist is the ability to make predictions based on data, Krowitz explains. “Customers are looking for help with things like predicting how much business there will be in a retail store, or sales volume per store. Or in a hospital, they want to predict how many patients will be admitted,” he says. “Armed with that data, they can better understand the relationships between how many staff members they need, or how to structure their supply chain, for example.”

Bachelor's degree required

Walsh holds a Ph.D. in machine learning and worked in a series of both academic and private-sector jobs involving



“You need to have a unique combination of interests and skills.”

—TOM WALSH, RESEARCH ENGINEER, KRONOS

applied machine learning and robotics before joining Kronos two years ago. Krowitz, who has a master's degree in computer science and a bachelor's degree in physics, came to Kronos after a stint at a neural networks company.

A bachelor's degree is required to become a data scientist, at a minimum, and a master's degree is recommended. But the degrees don't have to be specifically in data science, says Sue Metzger, a management information systems (MIS) instructor

at Villanova University. An MIS degree is a great foundation for a career in data science because the MIS curriculum focuses on sources of data and reaches into related areas like programming and database design, Metzger says.

Communication skills, and more

Also vital to the role is the ability to communicate the results of data analysis and visualization exercises to people who don't have the same level of technical

and analytics expertise.

“You need to have a unique combination of interests and skills: the curiosity to want to know what the data's telling you; the hard skills to get that data, to wrangle it into a form where you can analyze it; and the ability to explain in layman's terms the results of the analysis and the context of what that means for business,” Walsh says. “You have to repackage the output in a way that's meaningful for someone who has to act on that data.”

“Anyone at the management level isn’t necessarily going to want to understand the intricacies behind the data. They just want to know why it impacts them, and how to direct business strategy because of the results,” Walsh says. “So as a data scientist, you have to understand the business well enough to explain [data] to someone who’s going to make very important decisions based on it.”

Demand grows in several fields

Villanova has been “pretty aggressive getting into the data science and data analytics space because we know how applicable this area of focus is for a lot of different careers,” says Metzger. “If you’re going into marketing, you have to

get that minor. It’s also recommended if you’re going to be a programmer.”

IT recruiting and staffing firm Mondo has seen an increase in employer demand for data scientists with a number of specialties. “There’s this growing need, as the data science field evolves, for predictive analysis and explanation. That’s one of the largest spaces where we’re filling data science roles,” says Patrick Circelli, senior technical recruiter and lead technical trainer

at Mondo. “But we also see demand in areas like development and design companies, or software companies, especially those that have [software-as-a-service or platform-as-a-service] offerings that must constantly evolve their products based on user feedback and competitive analysis.”

As the field matures, organizations in various industries will continue to have a need for skilled and passionate data scientists, and they will increasingly

look for people with specialized skills.

“Now our clients are looking not just at hiring for general-purpose analytics; they’ll maybe hire a few people: One who solely sets up systems and algorithms to gather the data, and another to do analysis,” Circelli says. “It’s that evolution and shift in demand based on changing needs that’s so fascinating to see.” ♦

Sharon Florentine is a senior writer at CIO.com.

“You have to understand the business well enough to explain [data] to someone who’s going to make very important decisions based on it.”

—TOM WALSH, RESEARCH ENGINEER, KRONOS

What it takes to be a technology evangelist

How do you prepare for, land and succeed in the hottest roles in IT? This month, we look at the unique combination of skills a tech evangelist needs. BY SHARON FLORENTINE

At one point in his life, Michael Sage was a monk living in a monastery, but he has traded that cloistered existence for evangelism. His brand of evangelism doesn't involve religion, though — he's a tech evangelist, specifically chief evangelist at BlazeMeter, a software load and performance-testing company.

A tech evangelist is someone who advocates for the use of a specific technology, with the goal of helping it become an industry standard, says Michael Doonan, a partner at executive search firm SPMB, who notes that the role is becoming increasingly important in an IT-driven economy where systems and applications of all kinds compete for attention.

Explaining the need for tech evangelists, Doonan says, "Imagine if you're a platform-as-a-service startup, and you come into the market with a platform on which applications can be built, or software or services delivered, that removes the need for companies to develop their own internal, proprietary platform. Small companies, like startups, will take you up on that because it's cheap, it's easy and it's flexible. But part of the problem is growth and



Technology Evangelist

ROLES	Software developer, technology evangelist, software evangelist, sales and/or marketing specialist, pre-sales engineer
MINIMUM EDUCATION	Bachelor's degree preferred but not required
RELEVANT AREAS OF STUDY	Computer science, mathematics, engineering, psychology, sales, marketing, theater, public speaking
TECHNOLOGY SKILLS	Deep and broad knowledge of one particular technology
POTENTIAL EMPLOYERS	Software companies, application and platform providers (Amazon, Google) marketing and PR agencies
NATIONAL MEDIAN SALARY	\$111,374 (according to Glassdoor)

scale — how can you move upmarket into larger enterprises? That’s where evangelism comes in.”

Standout skills

The role of evangelist involves a mix of IT, sales and marketing skills, and even a bit of psychology and theatrics, says Sage. “You not only have to have technical depth and credibility, but also polished sales and marketing skills so that you can handle objections, you can promote messaging in a non-threatening way. And you have to know a lot about the business climate you’re operating in. What’s the market like? What are the circumstances that have brought a company to where it is?” Sage says.

There’s no one right educational path to becoming



“If you don’t know the tech or the market inside, outside and upside down, you’re not going to get the right message across, and you’ll look shady and untrustworthy.”

—MICHAEL SAGE, CHIEF EVANGELIST, BLAZEMETER

an evangelist, says Heidi Ellis, a professor and chair of the computer science and information technology department at Western New England University.

“You need enough of a technical background to speak reasonably about the technology, but it’s just as important to speak well and have great communication skills. I’d also say that business-focused people who know a lot about the inner workings and culture of a company that developed that technology could do extremely well in a role like this,” Ellis says.

Go deep

Most tech evangelists do specialize in one or two specific areas, whether it’s programming languages, software suites, Web platforms or something else, Sage says. Being a generalist might dilute the message you’re trying to send or hurt your credibility.

“If you don’t know the tech or the market inside, outside and upside-down, you’re not going to get the right message across, and you’ll look shady and untrustworthy,” he says.

Evangelists, much like sales and marketing peo-

ple, tend to have a certain personality type, too. “If you’re considering a role like this, you have to ask yourself honestly, ‘Will I be comfortable?’ If you’re quiet, shy and anxious, it’s going to be so much harder for you to get up in front of an audience or make presentations to groups of engineers,” Sage says.

If you’re considering a role as an evangelist, Sage has one last piece of advice: Practice, practice, practice.

“Pick a technology you love, and give everyone you know demos of it,” he says. “I remember in 2004, when

I was working at Hewlett-Packard, I got my first MacBook. I just fell in love with that thing, and I could not stop talking about it. At work, at home, I showed everyone. And then, one day, a guy I worked with made a snide comment about how effectively I was evangelizing this product, and it just clicked. That’s what we do, as evangelists — we embody the passion and the positivity that comes with ‘selling’ a great product.” ♦

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What it takes to be a research scientist

How do you prepare for, land and succeed in the hottest roles in IT? Here's look at the broad range of skills a research scientist needs. BY SHARON FLORENTINE

If you want a job as a research scientist at an iconic tech company, you'll need a broad range of skills. Just ask Amanda Stent. The path that led to her current role as a research scientist at Yahoo started with a high school class on artificial intelligence, followed by a college degree in math and music, and then a Ph.D. in computer science.

She's now a computational linguist, and the projects she works on at Yahoo are aimed at helping computers understand and produce language. She says studying music was just as valuable as studying math and computer science. "The music major gave me experience performing in public and a lot of experience in practicing until you get something right — that's really critical for research," Stent says.

A résumé like Stent's — one that reflects a broad and deep set of skills and experiences — is critical for a research scientist, says P.K. Agarwal, regional dean and CEO at Northeastern University–Silicon Valley.

"Large companies are usually looking at master's and doctorates for these positions, and



Research Scientist

ROLES	Research engineer, data scientist, data analyst
MINIMUM EDUCATION	Master's degree
RELEVANT AREAS OF STUDY	Big data, robotics, data modeling, machine learning, artificial intelligence, computational linguistics
TECHNOLOGY SKILLS	Mathematics, computer science, programming, analytics, statistics
POTENTIAL EMPLOYERS	IBM, Yahoo, large enterprises, IT startups, biotech firms, data analytics firms
NATIONAL MEDIAN SALARY	\$76,600

they want to see diversity in the educational background and experience,” he says. “They are trying to bring together people across disciplines to balance the conversations around technologies and new research and development, so you need more than hard skills. By the time you are past the R of research and into the D of development, the world and the tech may have changed, so there’s strategic value in education outside the traditional CS, mathematics and analytics.”

Constant change

Stent agrees that being able to keep up with changes in technology is key to success in applied research. Research scientists must constantly learn new programming lan-

guages, she says.

But again, breadth is key. In addition to requiring knowledge of multiple programming languages, Stent says her role requires mastery of linear algebra and statistics. And there’s another skill that’s invaluable: communication, specifically writing, because much of research involves persuasion.

“We’re constantly being asked to convince people that what we’re working on is both novel and relevant,” she says.

For a computational linguist like Stent, com-

munication isn’t just a soft skill. Her work involves research into ways to facilitate human-machine interactions through technology like chatbots and dialog systems. One of her areas of focus is analytics of human conversation.

Steady demand

Job titles in tech research include data scientist, data analyst, research engineer and research assistant, and Dice.com’s data and research team reports that demand for people to fill those jobs has been steady “with a few peaks in May

2015 and January 2016.”

Startups can be fertile ground for IT professionals interested in research. “The starting point for many innovative IT companies is, ‘I have this idea and can build this technology, but how do I make money with this thing?’” Agarwal says.

No success like failure

For Stent, the best part of her job is working with brilliant, innovative and creative people. However, she has a couple of caveats for anyone thinking of a software or engineer-

“We are inventing the future, so there’s always going to be failure, sometimes over and over again, until something succeeds. . . . And that’s the splendor of it all.”

– AMANDA STENT, RESEARCH SCIENTIST, YAHOO

ing research role: First, understand that it takes a lifelong commitment to learning and continual innovation, and second, understand that failure is part of the job.

“We are inventing the future, so there’s always going to be failure, sometimes over and over again, until something succeeds,” she says. But then, she adds, there are “the moments when you have a breakthrough — and that’s the splendor of it all.” ♦

Sharon Florentine is a senior writer at CIO.com.

What it takes to be a DevOps engineer

How do you prepare for, land and succeed in the hottest roles in IT? Here's a look at the technical and interpersonal skills you'll need for a career in DevOps. BY SHARON FLORENTINE

Variety is the spice of life. It's also what makes a career in DevOps endlessly fascinating. But the variety isn't just technical in nature. DevOps does require expertise in many types of technologies — software, infrastructure and middleware, for example — but it also involves knowledge of business processes and operational best practices. And some say that soft skills — interpersonal skills — are the most important of all.

“Critical thinking, problem-solving, communication and collaboration are the foundation for what makes DevOps work,” says Eric Sigler, head of DevOps at incident resolution software platform company PagerDuty. “Empathy, in particular, is a must-have. True DevOps engineers need a high degree of compassion and use it to enable those around them. If you're open to alternative points of view, you can pick and choose the best practices and skill sets available to solve the problem at hand.”

The aim of DevOps as a discipline is to ensure that the process of building, testing and deploying software is fast and reliable, and that the steps necessary to do those things are



DevOps

ROLES	Head of DevOps, DevOps engineer, systems administrator, network administrator, infrastructure engineer, engineering manager
MINIMUM EDUCATION	Bachelor's degree and five years of experience
RELEVANT AREAS OF STUDY	Computer science, mathematics, business
TECHNOLOGY SKILLS	Puppet, Chef, software development, scripting, infrastructure, storage, networking, security
POTENTIAL EMPLOYERS	Organizations of all sizes, from startups to large enterprises
NATIONAL MEDIAN SALARY	\$89,274

repeated as frequently as possible. A loose definition of DevOps might be “a culture, movement or practice that emphasizes collaboration and communication between software developers and other IT professionals while automating the process of software delivery and infrastructure changes.”

Modern-day sysadmins

DevOps is the natural evolution of what would have been a system administrator’s role a decade ago, says Jason Allen, CTO at talent acquisition software company Yello.

“Systems administration requires a broad set of skills, and DevOps is, in some ways, even broader,” Allen says. DevOps engineers “still need to keep servers running, deploy

applications built by the development teams, tune kernel parameters, build networks and work on storage devices,” he explains, but they also have “added responsibilities around development and programming, networking and security and cloud computing,” and they must “constantly find ways to improve the process of developing and deploying software faster.”

Not for newbies

DevOps isn’t appropriate for entry-level IT workers. At a minimum, you need

five years of experience in a few different IT roles, Allen says.

You can’t take a class and learn DevOps. “You need to have experience and proven skill in a variety of environments . . . not to mention the soft skills to break down the siloes that are present in many organizations,” he says.

A winding road

Sigler’s career offers a good example of what it takes to work in DevOps. He studied computer science at Missouri University of Science and

Technology and started his career running a cooperative server colocation business, managing mail and web infrastructure for small businesses. He then worked as a research system administrator for the University of Missouri–Rolla’s high-performance computing cluster, in addition to serving as a campus Linux administrator.

“After two years in that role,” Sigler says, “I moved to the managerial side, where I was responsible for overseeing the teams that handled both day-to-day operations and new

development for the server and desktop infrastructure at Rolla.”

He then spent a few years in private industry as a system administrator and later as a technical operations manager, handling planning, implementation and support of site reliability and IT infrastructure.

He joined PagerDuty three years ago as an operations engineer and then moved up to an engineering manager role where he supervised the developer tools team. Now in the DevOps practice, Sigler

“Systems administration requires a broad set of skills, and DevOps is, in some ways, even broader.”

– JASON ALLEN, CTO, YELLO

is working to expand DevOps skills beyond his team and evangelize DevOps culture throughout the company.

Solving problems

When recruiting people to work in DevOps, “it’s important to focus on how an engineer approaches problems,” Sigler says.

“We ask candidates questions that reveal their problem-solving process.”

The specific solutions they offer don’t matter as much as “how they got there,” he says, adding “I have seen very successful DevOps engineers with backgrounds ranging from computer science and mathematics to music or even philosophy.”

Most important are “the ability to learn and to think critically,” Sigler



“I have seen very successful DevOps engineers with backgrounds ranging from computer science and mathematics to music or even philosophy.”

—ERIC SIGLER, HEAD OF DEVOPS, PAGERDUTY

says. “Both are important in a field filled with constant innovation.

Technical chops

Of course, there’s more to DevOps than solving problems, and strong scripting skills are essential, because of the focus on automating testing and software delivery, says Yello’s Allen, adding that familiarity with networking, security, the cloud and infrastructure are all pluses. And Sigler says he values product-specific knowledge of tools like Puppet and Chef.

It’s not academic

Like many companies, colleges and universities still look at development and operations as separate disciplines and don’t offer integrated courses of study in DevOps. At the University of Michigan, for example, studying DevOps would mean taking classes in the schools of engineering, information and business, says Robert Scott, director of the Center for Engineering Diversity and Outreach and special counsel to the dean at Michigan.

For now, a DevOps-

oriented course of study would include computer science, engineering and the design and deployment of software, algorithms and IT infrastructures. Classes in managing and maintaining structured and unstructured data would also be important, as would studies of business strategy, business process development and analytics, Scott says.

Hands-on

That’s why the best route to DevOps is by gaining hands-on experience in a number of roles and learn-

ing how to think critically and solve problems.

“The best way to develop these skills is to diversify your point of view; it’s less about specific experiences and more about the variation in experiences you’ve been open to,” Sigler says. “So much of DevOps is about asking questions and figuring out how to initiate constant change for the better, so curiosity in every form is vital in a successful DevOps-focused career.” ♦

Sharon Florentine is a senior writer at CIO.com.



Systems Administrator (Sysadmin)

What it takes to be a Sysadmin

Despite dire predictions, the role of the systems administrator is far from obsolete. Nick Bush's career is proof that the job remains critical to IT even as it evolves.

BY SHARON FLORENTINE

With the ubiquity of cloud technology and the availability of modern systems administration tools that allow anyone from developers to administrative assistants to procure and provision servers and services, it's tempting to think that the role of the systems administrator, or sysadmin, is obsolete.

But the sysadmin role isn't going anywhere. It's evolving and becoming less focused on hardware and infrastructure and more on services delivery — a shift that's leading organizations to see systems administration as an innovation engine rather than a cost center. And that's great news for IT pros looking to further their careers.

ROLES	Systems administrator, network administrator, server administrator, DevOps engineer, systems support engineer
MINIMUM EDUCATION	Bachelor's degree or equivalent experience
RELEVANT AREAS OF STUDY	Computer science, networking, business, communications
TECHNOLOGY SKILLS	Microsoft server, Unix, security, cloud computing, virtualization
POTENTIAL EMPLOYERS	Organizations of all sizes in various industries, including retail, technology, insurance and manufacturing
NATIONAL MEDIAN SALARY	\$59,951

Constantly evolving

The constant evolution has kept Nick Bush engaged and fulfilled in his role as a sysadmin, a career that began back in his high school days.

“My friends and I were sort of the stereotype: We joined the A/V club and worked in the computer lab for the school district,” Bush says. “I worked for the district as a computer tech during summers, too. And then after I graduated, I went to DeVry University expecting to focus on computer engineering.”

Once at DeVry, though, Bush realized engineering wasn't for him, so he changed to information systems. Even then, his skills were in such high demand that he decided to leave school to work in systems support. He later



“My friends and I were sort of the stereotype: We joined the A/V club and worked in the computer lab for the school district.”

— NICK BUSH, SYSTEMS ADMINISTRATOR, MEADOWBROOK INSURANCE GROUP

took a job as a “technology engineer” — a one-man IT shop — for his old school district.

“I couldn't see myself sitting at a computer writing code for 40 hours a week; that wasn't for me,” Bush recalls. “When the school district offered me the technology engineer job, I knew that was where I wanted to be. It was me and another person handling around 200 teachers, 2,200 students over six buildings — that was a great challenge.”

After working in various roles at the school district

for 10 years, Bush moved on to network administrator positions — one of which was at a global retail company where he was part of an IT team for the first time. When that company downsized and laid off a number of IT folks, Bush found himself unemployed for the first time in his life. But he was out of work for only three weeks.

The fact that he was able to find a new job in less than a month “speaks to how important these roles and responsibilities are,” Bush says. “Even

without a college degree, the experience I'd had and the skills I'd acquired meant I wasn't stuck. Back then, and even now, job descriptions will say, ‘four-year degree or equivalent experience,’ and [when] you're interviewing . . . you're more likely to get questions about how you handled certain problems [that focus on] experience rather than education.”

Bush now works for Southfield, Mich.-based Meadowbrook Insurance Group, where he holds the title of systems administrator, Level 2. He works

out of Meadowbrook's Columbus, Ohio, office, where he supports around 200 users and manages many of the 80 physical servers and more than 200 virtual servers.

Experience trumps training

Like Bush, a significant number of sysadmins have little formal training but instead have learned on the job, according to a survey from IT infrastructure monitoring software company Paessler, which polled 650 sysadmins from 49 countries about

their education, their responsibilities and their everyday work.

According to Paessler, 41 percent of those polled said they have academic degrees, 36 percent said they have vocational training and 24 percent said they learned on the job.

“University training generally doesn’t cover sysadmin tasks. Vocational training would, but it would go out of date quickly,” says Kimberley Parsons Trommler, a product evangelist at Paessler.

As sysadmin roles have evolved, the education system hasn’t kept pace, so real-world experience is critical, says Jason Hand, DevOps evangelist and incident and alerting specialist at collaborative incident management software company VictorOps.

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— KIMBERLEY PARSONS TROMMLER, PRODUCT EVANGELIST, PAESSLER

“Having that formal education, even having certifications, doesn’t help as much as it used to, because so much of the success in the role can go back to cultural fit and experience,” Hand says. “If we hire you, we’ll send you to training and make sure you know what tools we’re using.”

DevOps, sysadmin skills overlap

If you’re planning to get a formal degree with the intention of becoming a systems administrator, Hand says your best bet

is to focus on the same areas of study as someone in DevOps would, since that’s how sysadmin roles are evolving.

Robert Scott, director of the University of Michigan’s Center for Engineering Diversity and Outreach, says classes in computer science and engineering as well as the design and deployment of infrastructure, software, algorithms and tools provide a strong technical background, while coursework in managing and maintaining structured and unstructured data is

important from the information systems side, and a knowledge of business fundamentals, strategy, business process development and analytics offer a solid business foundation.

Hand says it would be helpful to master specific hard skills, such as knowledge of tools like Puppet and Chef that help automate infrastructure and services management, containers like Docker, and cloud computing and virtualization technologies.

So, the next time someone tries to tell you that being a systems adminis-

trator is a dead-end career, take it with a grain of salt, because while the job is certainly evolving, it’s not going away, Bush says.

The sysadmin role “is so necessary in every company that uses IT,” he says. “There still needs to be people to manage and maintain networks, to help spin up and configure infrastructure, to serve customers and to innovate. There may be fewer of us, but that makes us more valuable.” ♦

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