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FOR IMMEDIATE RELEASE

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NOTE: This news release is a summary extract of content in the Q2 2017 update edition of Foote Partners' ***IT Skills Demand and Pay Trends Report***, a market intelligence trend report updated every 3 months from data contributed by 3,038 U.S. and Canadian employers and contains tech jobs and skills compensation and supply/demand benchmark research published in the firm's IT Professional Salary Survey and ***IT Skills and Certifications Pay Index™***.

Vero Beach, FL – June 10, 2017 - Extra pay awarded by employers to talented IT professionals for **916 certified and noncertified IT and business skills**---also known as skills pay premiums---remained virtually unchanged in the first quarter of 2017, falling a slight 0.1% overall. In just the first three months of the year 99 certified and noncertified tech related skills made gains in cash market value while 119 lost value, for a high volatility index mark of 24.8% (for more detail see page 40).

This according to the latest quarterly update of Foote Partners' ***IT Skills and Certifications Pay Index™*** (ITSCPI) based on compensation data provided by 3,038 North American private and public sector employers who partner with our firm to report pay for their 262,540 IT professionals.

Drilling down further, overall market values for **494 noncertified IT skills**—currently averaging the equivalent of **9.3% of base salary for a single certification**---increased 0.5% in the first quarter of 2017, the 41th quarterly gain in the past 50 quarters. They have shown a steady, sustained performance stretching back to mid-2004, driven most recently by gains in Database, Operating Systems, Enterprise Business Applications, and Applications Development Tools & Platform skills.

For the second time in the past 15 calendar quarters the average market value for **422 IT certifications** dipped slightly overall, losing 0.6% of their market value. Currently earning the equivalent of **7.6% of base salary on average for a single hot skill**, losses this quarter were recorded in Applications Development/Programming Languages, Systems Administration and Engineering, Info/Cyber Security, and Archiitecture/Project Management/Process certifications.

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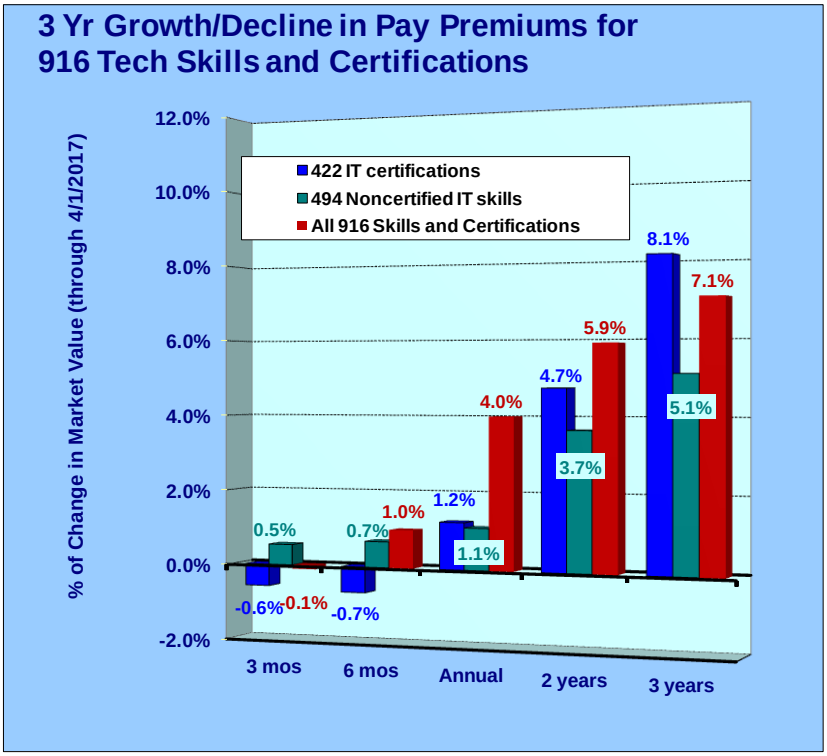
Since its launch in 1999, the ***IT Skills and Certifications Pay Index™*** has continuously tracked quarterly market values for individual IT skills and certifications earned by 70,725 tech professionals at employers in 83 U.S. and Canadian cities. Rigorously validated data and detailed market analyses are updated and published by Foote Partners every 90 days. .

Figure 1

Pay Performance, 3/12/24/24/36 months
Certified vs. Noncertified IT Skills

(72,120 IT professionals, data through 4/1/2017)



Source: Foote Partners, *IT Skills and Certifications Pay Index™*
(1Q2017 – 1Q2014 editions)

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HIGHLIGHTS: Quarterly and Annual Results – Through April 1, 2017

A. IT Skills and Certifications Pay Performance: By Category

NONCERTIFIED IT SKILLS. Cash pay premiums for **494 noncertified skills** increased slightly during the first quarter of 2017, gaining an average of **+0.5% i**n market value. Pay performance was stronger across four of eight noncertified skills categories reported:

- Database skills: **+1.7%** (in average market value)
- Operating Systems skills: **+0.8%**
- SAP & Enterprise Business Applications skills: **+0.7%**
- Applications Development Tools & Platforms skills: **+0.3%**
- Messaging and Communications skills: **No change**
- Systems/Networking skills: **-0.3%**
- Web/eCommerce Development: **-0.6%**
- Management/Methodology/Process skills: **-1.5%**

Pay performance over the past twelve months has also been strong but in a different ranking among categories:

- Operating Systems skills: **+9.9%** (in average market value)
- Messaging and Communications skills: **+6.0%**
- Database skills: **+5.6%**
- Applications Development Tools & Platforms skills: **+0.9%**
- Systems/Networking skills: **+0.7%**
- Web/eCommerce Development: **+0.3%**
- SAP & Enterprise Business Applications skills: **-4.4%**
- Management/Methodology/Process skills: **-4.4%**

IT CERTIFICATIONS. Cash pay premiums for **422 IT certifications decreased -0.6%** in first quarter of 2017 for a second consecutive loss following fourteen consecutive quarters of gains in overall market value going back to mid-2013. Prior to that the ***IT Skills and Certifica- tions Pay Index™*** recorded *25 consecutive calendar quarters of declining overall market value* for certifications beginning in 2007.

Only three of eight certifications segments in the new ITSCPI data posted gains last quarter:

- Foundation and Training certifications: **+3.1%** (in average market value)
- Database certifications: **+0.9%**
- Networking & Communications certifications: **+0.6%**
- Web Development certifications: **No Change**
- Architecture/Project Management/Process certifications: **-0.4%**
- Applications Development/Programming Lang. certifications: **-0.6%**
- Information Security certifications: **-1.4%**
- Systems Administration/Engineering certifications: **-2.1%**

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HIGHLIGHTS – cont'd:

Pay performance over the past twelve months has also been mixed::

- Information Security certifications: **+6.4%** (in average market value)
- Applications Development/Programming Lang. certifications: **+4.7%**
- Web Development certifications: **No Change**
- Foundation and Training certifications: **No Change**
- Database certifications: **-0.1%**
- Architecture/Project Management/Process certifications: **-1.1%**
- Networking & Communications certifications: **-2.0%**
- Systems Administration/Engineering certifications: **-3.4%**

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Trends Discussion & Analysis

IT Skills and Certifications Pay Index™ – 1st Quarter 2017 data edition

Data collected through April 1, 2017

(This section is based on insights from Q1 2017 pay trend charts section beginning on page 20)

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TRENDS DISCUSSION AND ANALYSIS

INTRODUCTION. It's difficult to find an employer that isn't struggling to come up an its own unique tech staffing model that balances three things: the urgencies of new digital innovation strategies, combating ever deepening security threats, and keeping integrated and increasingly complex systems and networks running smoothly and efficiently.

The staffing challenge has moved well beyond simply having to choose between contingent workers, full-time tech professionals, and a variety of cloud computing and other services options. Over the next few years managers will continue to be tasked with leading a massive transformation of the technology and tech-business hybrid workforce to focus on delivering a wide variety of operational and revenue generating solutions quickly and predictably:

- Internet of Things/M2M/ Telematics
- Big Data/BI analytics/Information Integration
- Digital engagement
- Machine Language/AI
- Mobility
- Cyber threats
- Cloud computing
- Real-time DevOps and Micro Service Architectures
- Carbon-reducing technology/exponential energy
- Telemedicine
- Emerging: Cognitive Computing; driverless vehicles; Immersive interfaces; 4D Printing

All of these depend on solving the puzzle of getting the mix of critical technology and business skills and experience *just right* when shortages of skills and talent have never been more profound or more constraining in effecting business transformation.

These changes don't happen overnight. Practically speaking, it takes a few fiscal cycles to get budgets in line and recruiting and training efforts in place to build a new foundation for the optimally restructured workforce. And 'clean sheeting' your organizational systems and practices isn't realistic: you need to build a new human resource foundation under what you're already doing, incrementally strengthening that foundation over time. This takes a well-thought out job role architecture plus carefully crafted agile compensation models to get people paid to true competitive market levels and incented to perform at high levels.

Many employers have already defined their strategic workforce plans to meet present and future skills requirements and they are somewhere in the middle of their multiyear business cycle transition. 2017 and 2018 are the years when they will find out if their labor strategies are shrewd, practical, and properly executed.

Perhaps the largest stumbling block technology and business leaders will face is patience and resolve: to not fold amidst waves of resistance to change. While organizational transformation on this scale takes leadership and backbone, it also requires good data and market intelligence. Foote Partners skills and certifications pay premium benchmark research and data-driven tech workforce market analyses are designed to provide that.

IT Skills and Certifications Pay and Demand

Who needs skills pay and why. More employers than ever are paying their tech workers extra cash over and above salary for specific certified and uncertified tech and business skills they possess. Why would they do this?

Because getting compensation right has been a nagging problem with tech professionals for years. There's constant supply/demand market price volatility for many hard-to-fill positions, but an even bigger impact on staffing has been multidimensionality: countless variations in jobs that tech people perform. It's tough to calculate labor market pricing when employers require hybrid tech-business experience, soft skills, industry knowledge, specific solution aptitude, and especially

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

experience with a particular product or service or certain kinds of customers. And all of this in addition to proven tech expertise that can span multiple platforms, domains, programming languages, systems, databases, and tools.

But the true problem that paying skills premiums solves is aging HR systems, inflexibility, and lack of agility in compensation structures and pay practices. Salary alone is too often not sufficient; an employer has to find ways to come up with more cash to compete with peer organizations that already have greater agility built into their salary and bonus programs. If an employer cannot react quickly and correctly it may be in real trouble finding and keeping people to execute fluid tech enabled business strategy.

Say, for instance, your company doesn't normally have trouble retaining tech talent and suddenly the best people start walking out the door. Most likely your company wasn't able to match competing salary offers. Then to make matters worse it's discovered that the competing offers were actually realistic average local market salaries for these positions---your employer was actually underpaying these people what they're worth from the start. It's called 'salary compression': when market driven pay for talent is growing at a faster rate than the annual salary increases employers are able to offer their workers. Compression is a widespread systemic reality that tends to be much worse in the tech workforce because of the rapid evolution of technology, skills, and jobs. Every employer must decide whether to fix it permanently (very difficult) or patch it occasionally (less difficult and more practical).

If there is little leeway in the incumbent's salary range to sweeten the pot on a counter offer, and a promotion is not a viable option, paying workers extra cash for critical skills and certifications can be the perfect solution. Especially when workers possess the very hot certified or noncertified tech skills that other employers are aggressively targeting. The trick is to tie this extra cash directly to current market value for the hot skill or certification and guarantee that premium for some period of time, usually one year or more. When time's up the employer can check whether market value has changed and decide if it makes sense to continue to pay the skills premium and how much to pay. Or, switch it out for another hot skill that's become more valuable to the organization.

Perhaps the hidden advantage of using skills pay to solve short term compensation practice shortcomings is it buys you valuable time to work on a more permanent fix to structural problems such as salary compression and replacing bad salary surveys that aren't providing accurate local market salary levels against which to measure pay for your most important tech talent.

Security skills pay gap narrows but demand continues to grow. Market values for 83 info/cyber security certifications have been on a steady upward path for four years, **up 6.4% in average cash value as a group in just the past twelve months and 13.1% during the past two years** despite a slight drop in the first quarter of 2017. Our findings indicate that information security professionals are maturing in skills and capabilities just as the increasing sophistication of cyber-attack capabilities are demanding more experienced infosec professionals. Strong performing security certifications in the past year cuts a wide swath: cybersecurity, forensics, penetration testing, perimeter protection and enterprise defense, security analysis, risk, and security software programming.

That's the good news. The bad news is that while cybercriminals and hacktivists are increasing in numbers and deepening their skill sets, the "good guys" are still struggling to keep pace in 2017 as hyper connectivity increases. CISOs are on notice that they will have to become more effective acquiring or internally developing the skill sets their organizations need and building sustainable practices to retain existing talent and solidify their organizations' cyber resilience.

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

Without a doubt a cyber security skills gap has developed on a global basis. Evidence of this in Foote Partner's latest ***IT Skills and Certifications Pay Index™*** data: the **Certified Cyber Forensics Professional** is one of three certifications earning the highest certification cash premium among all 422 reported in the *Pay Index*—averaging the equivalent of 17% of base salary. The **CyberSecurity Forensic Analyst** certification follows closely behind in premium pay. Notes Foote, "In our most recent April data update of our ***IT Professional Salary Survey***, Cybersecurity Specialists with three years of experience are averaging $101,000 in base salary in 67 U.S. cities. Senior level cyber specialists with five years experience are averaging $119,800 with a top average salary of $151,530 in San Jose, California.

But with a nagging lack of consistency nationally in cybersecurity career definitions, and a shocking dearth of experienced cyber professionals, employers can expect to experience difficulties in attracting and retaining cybersecurity talent for months or even years to come. Cybersecurity has been around for many years in government and industries targeted by cyber terrorists but in most companies it's a nascent profession, still evolving in skill sets and training protocols. "Hands-on experience in a cyber security environment is more critical to cyber security jobs than just academic learning", insists Foote. "Only 7% of the top universities around the world offer a technical cybersecurity degree at the undergraduate level. Cybersecurity curriculum has to dramatically expand and colleges need to aggressively pursue internship opportunities for their students to expose them to real-world conditions. There's got to be clear channels for attracting people into a profession that does not have the cache of software development".

"The demand for cybersecurity talent expected to rise to 6 million globally by 2019 with an expected shortfall of 1.5 million professionals and a demand rate growing 3.5 times faster than the overall IT labor market. We're going to need as many people as possible to 'hit the ground running' to meet the demand. That's going to be a tall order not to mention a bit unrealistic in the short term. The fact is it's going to take another three to five years to narrow this particular skills gap. We'll get there if the money and incentives are sufficient to get vendors, employers, and training organizations focused on the solution."

Employers are becoming more aware that they don't have the right people in their security departments. They may have very good technical people who can fix firewalls and implement basic perimeter solutions. But what's missing are security professionals who understand threat intelligence and intrusion analysis, incident handling, forensic information has been infiltrated. The linkage between the business and the info and cybersecurity organizations is still too weak from a labor perspective despite a lot of interest in the subject. More resources allocated to the security challenges is critical.

"In some cases it's going to become apparent that organizations simply don't have the right security leadership in place," states Foote. "Organizations will have to ask themselves if security itself is sitting in the right place within the organization, who is accountable for security, and how to hold them accountable. You can't avoid every serious incident, and while many businesses are good at incident management, too few have an established, organized approach for evaluating what went wrong and how to fix it. As a result, they are incurring unnecessary costs and accepting inappropriate risks.

Organizations of all sizes need to take stock now in order to ensure they are fully prepared and engaged to deal with these emerging security challenges and in particular cyber security strategy. By adopting a realistic, broad-based, collaborative approach to cyber security and resilience, government departments, regulators, senior business managers and information security professionals will better understand the true nature of cyber threats and how to respond quickly and appropriately.

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

Some companies are augmenting their staffing with machine learning technology and probability theory to model patterns of behavior and flag anomalous activity. Machine learning technology is increasingly being adopted as a way to reduce the noise (alerts) that traditional security
products produce and to bubble up mid- and high-level concerns to IT staff. The discipline of machine learning finds its way into many large companies through the hiring of data scientists, who use algorithms to efficiently analyze event logs for their security teams.

Overall we expect an increase in high-profile breaches in the near future that will push corporate boards and senior business executives even farther to face the fact that for decades they have not been adequately staffing their corporate security operations. They're taking data threats more seriously because these threats have broadened from just a few industries to several and cyber hackers seem to be focusing not just on highly monetized breaches but those that can intentionally inflict damage to brands and entire companies.

Gains in Pay for Advanced Data Analytics skills. For all the interest in the use of advanced analytics to enable companies to understand, package, and visualize data for enhanced decision making, the truth is that the marketplace for so-called Big Data skills has been surprisingly volatile.

In early 2014 our benchmark research revealed a decline in average pay premiums for 58 advanced data analytics related skills and certifications. By year end our ***IT Skills and Certifications Pay Index*** recorded a drop of nearly 5% in average value for these skills during that year. In 2015 this trend had been reversed with 74 advanced data analytics related skills and certifications increasing in average value by 6% for the year. Then in calendar 2016 cash pay premiums for 116 advanced data analytics related skills and certifications were up 4.8% overall in market value. In the first quarter of 2017, 123 related certified and noncertified Big Data skills tracked by Foote Partners posted a modest 0.3% gain.

- Advanced data analytics noncertified skills market value gainers in Q1 2017, **ranging +6% to +25% (**in descending order):

  - QlikView
  - Data Science
  - Apache Struts/Struts2
  - Apache Flume
  - R language
  - MongoDB
  - Cloudera software
  - Webtrends analytics
  - Amazon DynamoDB
  - Clojure
  - Apache Pig
  - MapReduce
  - Apache Hive
  - Hbase
  - Sqoop
  - Quantitative Analysis/Regression Analysis
  - Metadata design and development

- Highest paying Big Data related certifications in Q1 2017, **earning an equivalent 9% to 12% % of base salary** (in descending order):

  - Cloudera Certified Professional: Data Scientist
  - SAS Certified Data Scientist
  - Cloudera Certified Developer for Apache Hadoop
  - EMC Data Science Specialist, Advanced Analytics
  - Oracle Certified Master - DBA (OCM)
  - HP ASE Vertica Big Data Solutions Administration
  - SAS Certified Advanced Programmer
  - Cloudera Certified Specialist in Apache HBase
  - Teradata 14 Certified Master
  - IBM Certified Database Administrator - DB2
  - Oracle Certified Professional - DBA (OCP)

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

What's been responsible for these ups and downs over the past few years? In depth interviews we conducted with executives and decision makers at more than 300 employers revealed organizational and cultural barriers related to transparency, data governance, and sharing of data enterprise wide in siloed enterprises. For others there were concerns that they were understaffed in the kind of sophisticated big data skills and experience necessary to analyze their structured, semi structured and unstructured data. The bottom line is that companies have to find their own advanced data analytics 'sweet spot'. That means being realistic about what they can change and what you can't as far as institutional barriers.

"Companies are having success working past these early barriers of resistance. We believe pay premiums for advanced data analytics related skills and certifications will steadily rise over the next 12 to 24 months, building on the positive momentum we've seeing our benchmark survey data this year and the second half of last year," forecasts Foote. "It appears that noncertified Big Data skills are the real winners here: not only are they averaging the equivalent of 12% of base salary cash premium for a single skill compared with only 7.5% for a certification, they're also showing strong quarter-to-quarter market value growth.

Foote says there are two explanations. "First, the marketplace may is getting saturated with vendor Big Data solutions and as more certifications are earned, supply catches up the demand for those certifications, driving values down. Another possibility is that as with hot skills in general, employers may have their own internal accreditation mechanisms in place when hiring and deploying talent. Instead of relying on vendor certifications to define skill levels in big data solutions they have their own ways of determining the competency of individuals who are working in big data initiatives

"Advanced data analytics capabilities are just too critical for staying competitive. They've expanded in popularity from a few industries to nearly every industry and market. And there is the Internet of Things, the next critical focus for data and analytics services. IDC is predicting a 30% CAGR over the next 5 years while McKinsey is expecting IoT to have a $4 to $11 trillion global economic impact by 2025 as businesses look to IoT technologies to provide more insight."

The increasing influx of data available to organizations requires the expansion of infrastructure used to house, process, analyze and visualize intelligence. Rich media analytics will be the driver behind many big data projects. The increased demand for greater sophistication in analysis and data consumption requires that organizations refine talent acquisition strategies to compete in the skills gap. For example there will be an ever increasing demand for analysts capable of transforming IoT data into actionable business intelligence.

User Experience (UX) and User Interface (UI) Design skills in high demand. Customers now expect a best-in-class experience from any product, regardless of cost. The UX of an app could be the edge in getting a smart product noticed, purchased, and actually used. While UX design is a relatively new tech field, companies learned long ago that the aesthetics and usability of websites and applications can have a major impact on their bottom line. This is especially true as mobile technology has become more and more ubiquitous in our business and personal lives. The best user experiences are a marriage of multiple skills including marketing and graphical design.

User experience (UX) design focuses on the interaction between the user and the system, and whether or not this interaction is visually and mentally satisfying. A UX Designer is aware of the contextual information and how content will fit into it. UI design is a sub-discipline of UX, where the designer focuses on the interaction between the user and the product they are building. UI designers also tend to have a hand in the visual design of elements on the page within a product.

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

Noncertified UX/UI skills in the latest ***IT Skills and Certifications Pay Index™*** have shown solid growth in pay premiums, ***up 7% in value in the past six months***. Mid-level UX/UI Designer base salaries in Foote Partners' **2017 IT Professional Salary Survey** are averaging $90,100 nationally (67 U.S. cities), $102,920 at the senior level and $121,570 for lead level. Among the twenty largest U.S. labor markets those average salaries rise to $96,940, $110,800, and $130,870 respectively.

DevOps continues growth spurt. Bridging the gap between developers and operations has always been a problem due to conflicting interests around project budgets and performance. Straddling the line between the two is what DevOps is all about, however acceptance of DevOps methodologies and practices had been slow for years because of cultural barriers and natural resistance to changing longstanding practices for building, testing and releasing software solutions. But no more: speed and agility have now become mainstays to competitiveness Improved collaboration and communications at all stages from conception to delivery are now more mainstream than ever.

Foote Partners latest pay premium data for 3,038 employers shows a ***average gain of 7% in cash pay premiums for noncertified DevOps skills in the past twelve months***. On the job level DevOps engineers have been in big demand as more employers deploy a formal strategy. That this is still a maturing field which means specialists are able to secure pay rates above the market average in more generic engineer roles. Below are 1st Quarter 2016 data edition salaries (data collected through 1/1/2017) for three levels of DevOps Engineers from our firm's **2017 IT Professional Salary Survey.**

Figure 2 – DevOps salaries

Job Title	Experience Factors	National Aver. Salary (65 U.S. cities)
Lead DevOps Engineer	7+ years of relevant DevOps or development experience including hands-on technical operations and coding. 4 years of experience working with Continuous Integration and Deployment tools. 4 years experience with system orchestration tools such as Puppet, Chef, etc.	$133,900
Sr. DevOps Engineer	5+ years of relevant DevOps or development experience including hands-on technical operations and coding. 3 years of experience working with Continuous Integration and Deployment tools. 3 years experience with system orchestration tools such as Puppet, Chef, etc.	$116,000
DevOps Engineer	3+ years of relevant DevOps or development experience including hands-on technical operations and coding. At least 1 year of experience working with Continuous Integration and Deployment tools. 2 years experience with system orchestration tools such as Puppet, Chef, etc.	$102,500

Source: Foote Partners ***2017 IT Professional Salary Survey***

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

Internet of Things explosion will create staffing deficits. McKinsey is expecting the Internet of Things (IoT) to have a $4 to $11 trillion global economic impact by 2025 as businesses look to IoT technologies to enable new business models and transform business processes. IDC is predicting a 30% CAGR in IoT over the next 5 years. Gartner predicts that by 2020, more than 25 percent of identified attacks in enterprises will involve IoT, although IoT will account for less than 10 percent of IT security budgets. A recent AT&T study titled "The CEO's Guide to Securing the Internet of Things" reports that 90 percent of organizations it surveyed lack full confidence in their IoT security.

Three key questions come to mind: What can employers and tech professionals do to prepare for IoT? What jobs and skills are needed to transition into an IoT world? What is trending right now in jobs, skills, and certifications that is being driven by IoT growth?

Staffing for the "things" portion of IoT is defined by a number of elements addressing device management, MEMS (Microelectromechanical systems), and integration and gateway skills.

Device Management/MEMS

- Embedded systems, software and design
- Wireless sensor network design
- Circuit design
- Microcontroller programming
- Machine learning
- Sensor data analysis
- Quality assurance and testing

Integration & Gateways

- MQ Telemetry Transport
- TCP/IP
- IPV4 & IPV6
- Programming (e.g., Node.js)

Hot jobs in the "things" space include:

- Data Scientists
- Network Engineers
- Design Engineers
- Hardware Engineers
- GPS Development Engineers
- Electrical Engineers
- Network Engineers
- AI Engineers
- Info/Cyber Security Engineers and Analysts
- Info/Cyber Security Infrastructure (cloud, network, software development)

The area of the Internet of Things particularly rich in in-demand skills and jobs is the connecting of the "I" with the "T". We believe employers will focus a great deal of their efforts in the broad and diverse skills and jobs that make up the connective tissue, among them :

- Cybersecurity
  - Visibility, Analytics, Identity, Risk
- AI Experts
- UX/UI Designers
- Interaction Designers
- Visual Designers
- Product Designers
- Digital Product Designers
- NoSQL and NewSQL Apache Spark
- BI Professionals
  - JIRA, Confluence, Cognos, Tableau, SSAS, SSIS, SSRS, Advanced SQL and SAS, Predictive Analytics
- Big Data
  - Apache Hadoop, HDFS, Hbase, MapReduce, Flume, Oozie, Hive, Pig, YARN
- Cross-Skilling
  - HW skills for software developers
  - SW skills for hardware developers
- Communication interfaces
- Associative thinking
- Collaboration
- Pattern recognition
- Machine Learning
- Data Mining

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

Objects in the Internet of Things will come in every shape and size; some will have very small screens, and others will have no visual display at all. Talented ***User Interface and User Experience Designers*** will be a hot commodity as IoT providers strive to develop effective, user-friendly interfaces despite this shift in paradigm. Marketable skills for UI/UX Designers in the IoT include Responsive Web Design (wherein visuals dynamically adjust to screen-size, platform and orientation) and Service Design (human-centered design approach that intuitively guides users through complex services).

Early IoT products are going to be mostly rules-driven IFTTT ("If This Then That" web services) kinds of programs. For more complicated decisions in IoT, ***AI experts*** will be in high demand especially in the retail space.

With so many devices consuming and sending exabytes of raw information, the true potential of "big data" will be realized as IoT evolves. Organizations will endeavor to collect, store, and analyze smart device data streams for actionable intelligence. ***Business intelligence specialists*** with skills in sensor data analysis, data center management, predictive analytics, and programming in the leading big data platforms---such as Hadoop and NoSQL---will be ideally positioned to meet these needs. Strong business acumen will also be a key differentiator, particularly for BI executives tasked with divining additional opportunities in the burgeoning Internet of Things.

Hot business intelligence skills in the IoT area include:

- ***QlikView (+33% in market value, last six months), Tableau, Cognos***. Data visualization is a hot skill and these are arguably the most popular products in this purpose.

- ***SSAS (+20% in last six months), SSIS,*** *and* ***SSRS.*** There are various database management tools such as SQL Server Analysis, Integration and Reporting Services (SSAS, SSIS and SSRS respectively) that are extremely useful in developing and managing organization reports. Similarly, SSIS and SSAS comes in handy when analysis and integration of large data sets are required.

- ***Advanced SQL and SAS***. SAS ***(+11% in market value, last twelve months)*** are statistical analytic systems that perform analysis at various levels in a large data set and includes a variety of modules such as business intelligence, data management and predictive analysis. SAS and Advanced SQL have wide applications in the IoT domain.

- ***Predictive Analytics.*** Predictive data and analytics are now considered a backbone of rapidly growing IoT. Over the next few years the internet will be full of information from millions of devices across the world. Businesses will be more concerned about what they should be doing this plethora of information.

A major force likely to drive the Internet of Things is ***advanced data analytics*** (aka Big Data). IoT devices will work by collecting vast amounts of data and analyzing them, ensuring fast communication and quick solutions. Even if your company doesn't seem like it would make use of big data, chances are if it is using an IoT device it will need to have at least some functional knowledge of big data. If a company is developing IoT devices, it will want to design them with data in mind first so they can function properly and efficiently. This skillset is particularly useful and valuable since right now there is a shortage of people with big data talents. At the same time, having knowledge of technologies often used with big data should be strong consideration in building an IoT workforce.

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

IoT explosion, cont'd.

Key advanced analytics skills in the IoT area include:

- ***Apache Hadoop and related modules (HDFS, Hbase, MapReduce, Flume, Oozie, Hive, Pig, HBase, YARN)***. Apache Hadoop is the Java-based open source software framework used for storage and processing of distributed storage with very large data sets. It can be implemented on networks that are built on very large scale and at a very low cost.

- *No**SQL** (+9% in market value, last six months), and **NewSQL**.* Understanding of database management systems is critical in IoT. As businesses expand into various dimensions the need for scaling database management systems will increase as compared to old school relational database management systems. NoSQL and NewSQL provide an alternative scale-up database management to the traditional DBM solutions.

- ***Apache Spark** (+8% in market value, last twelve months*. Understanding of database management systems is critical in IoT. As businesses grow and expand into various dimensions, the need for scaling database management systems will increase as compared to old school relational database management systems. NoSQL and NewSQL provide an alternative scale-up database management to the traditional DBM solutions.

- ***Machine Learning** (paying 13% - 18% of base salary equivalent) and **Data Mining** (9% - 13% cash premiums).* Massive data sets in Internet of Things make the network too complex to be dealt, tracked or analyzed by humans. An IoT team developing enterprise-grade projects need to be good at machine learning and data mining techniques to be able to handle the huge data sets effectively.

*IoT Cross-Skilling**.*** IoT is such a broad area that software developers will most likely have to program in a number of languages. *Low-level assembly or C/C++ programming* will be required for embedded systems. At the same time *higher-level languages such as Node.js or Java* will be needed for devices with more available resources. In addition, communication protocol skills will be vital because an IoT device is nothing if it can't share its data.

- ***Hardware skills that will be most useful for software developers*:** Most likely, it will be the basics. Software developers won't be designing the next revision of a product's printed circuit board (PCB) but it would be useful to be able to build out a circuit on *a b*readboard for prototyping. Understanding basic electronics will be valuable. Software Developers should know how basic components like resistors, capacitors, LEDs, and such behave in a circuit. Other important skills for Software Developers might include reading data sheets, understanding timing diagrams and clocking, electronics concepts such as pull-up and pull-down resistors, Hi-Z, active-low and active high, and logic gates and transistors.

- ***Software skills for hardware developers*:** Hardware developers will be designing the next revision of the product's PCB. They'll be selecting and integrating microprocessors, sensors, and radio interfaces, Like their software developer counterparts, their work will cover everything from low power embedded devices to high(er) power, high(er) resource devices. Hardware developers in the IoT world could also find it useful to know software basics. The goal is not simply to build out a 200,000 line source code base complete with an underlying build system but rather to gain an appreciation of the requirements of the other half of a development team. For example, software prototyping skills. High level languages such as **Node.js** or **Java** are excellent starting points for people new to programming. They're easy to learn and benefit

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

from some useful features like automatic memory management. Hardware engineers could advance their skills further by studying C and C++ and managing process memory manually, or understanding how a sensor can be read in software through, for instance, a DAC over an I2C bus. This kind of knowledge will help hardware developers appreciate the importance of building their components with software flexibility in mind. For example, providing flexible I/O options so that the software team has more options available to them when they are building out the software to sit on top of the hardware team's work.

Digital transformation intensifies…but it's rocky path. One of the most disruptive trends reshaping the technology workforce right now is being driven by companies responding to a single question: How do we use digital innovation to create new products, processes, and experiences that will create and drive important new streams of revenue? Rising demand for digital experiences has forced companies to accelerate the pace of initiatives intended to capture new customers.

Digital transformation has become a competitive necessity and not just a growth enabler. The problem is that recent surveys reveal that while a very high percentage of executives cite digital transformation as a priority, only a very small percentage believe their business actually has a clearly defined digital transformation strategy.

We believe the core issue contributing to this inconsistency in vision and reality is that not enough companies have the necessary skills and talent available to imagine the possibilities of a digital world, create a strategy, and then execute on that strategy to bring the ideas to life. This is reminiscent of the early days of the Internet when employers were actively searching for the foundation talent to transition their products and services into online delivery and support models. The disruption is that there simply isn't enough talent *at the right level of experience* in the marketplace right now to satisfy the demand. And it will get worse before it gets better.

A recent study by IDT and SAP revealed that only 17 percent of respondents had enough employees with the right skills to embark on a smooth digital transformation. Across all skill domains, respondents noted substantial gaps in digital skills. For example, nearly 73% of respondents claimed that extensive big data analytics skills are important for the digital transformation of the company. But, only 39% claim to possess the skills necessary in this domain. And only 10% of the respondents claimed that their HR department has implemented a recruitment/training program to close the skill gap. Skills identified as important for digital transformation include (*ranked by importance*):

1. Digital Security
2. Business Change Management
3. Business Networks
4. Big Data Analytics
5. Internet of Things
6. Product Service Offerings
7. Mobile Technologies
8. InMemory Databases
9. Cloud Computing
10. Social Media
11. Entrepreneurship
12. Novel Interfaces

Digital product design and delivery is being produced by 'digital ecosystems' of products and interactive experiences supported by major alignment of technology and strategy. It also takes crisp execution by people inhabiting many new jobs in areas of engineering, applications development, QA, operations, and marketing that, for many companies, have not previously existed. So the execution challenge is to carefully define each role, go out and hire the talent to fill them, and figure out how to pay and reward people in these jobs so you don't lose them. This has not been an easy task for many companies, made worse by the pressure to produce results as quickly as possible.

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

Digital transformation, cont'd.

According to McKinsey Global Institute, the Product Manager role has become the glue that binds the many functions that touch a digital product---engineering, design, customer success, sales, marketing, operations, finance, legal, and more. Unlike product managers of the past, who were primarily focused on execution and were measured by the on-time delivery of engineering projects, the product manager of today is increasingly the mini-CEO of the digital product. They wear many hats, using a broad knowledge base to make trade-off decisions, and bring together cross-functional teams, ensuring alignment between diverse functions.

In the world of software-as-a-service products with modular features rather than a single monolithic release, digital products are increasingly complex for product managers. Managers must now oversee multiple bundles, pricing tiers, dynamic pricing, up-sell paths, and pricing strategy. Life cycles are also becoming more complex, with expectations of new features, frequent improvements, and upgrades after purchase. At the same time, the value of the surrounding ecosystem is growing, with digitally enabled products increasingly just one element in an ecosystem of related services and businesses. This has led to a shift in responsibilities from business development and marketing to product managers. New responsibilities for product managers include overseeing the application programming interface (API) as a product, identifying and owning key partnerships, managing the developer ecosystem, and more.

Pay premiums for hot digital skills in the most recent data edition of our ***IT Skills and Certifications Pay Index™*** support the notion that there is a widening gap between supply and demand for digital related skills – see next page

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

Figure 3 – Pay Performance: Sampling of Noncertified Digital Transformation skills

Selected Digital transformation skills	Pay Performance: Gains/Declines in Premiums (through 4/1/2017)		
	3 mos.	6 mos.	12 mos.
Rackspace Cloud	28.6%	28.6%	12.5%
Unix (all)	12.5%	12.5%	0.0%
Git/GitHub	11.1%	11.1%	11.1%
Linux	11.1%	11.1%	11.1%
Apache Lucene	8.3%	18.2%	18.2%
User Experience/Interface Design	7.1%	7.1%	7.1%
Amazon RedShift	0.0%	8.3%	30.0%
Mobile operating systems (iOS, Android, etc.)	0.0%	0.0%	12.5%
RabbitMQ	0.0%	0.0%	12.5%
Amazon Web Services (EC2, S3, SQS, ELB, et. al.)	0.0%	0.0%	10.0%
Data security	0.0%	0.0%	10.0%
Java SE/Java EE	0.0%	0.0%	10.0%
PostgreSQL	0.0%	0.0%	10.0%
Ruby	0.0%	0.0%	10.0%
Redis	0.0%	0.0%	9.1%
Go language (Golang)	0.0%	0.0%	8.3%
Scala	0.0%	0.0%	8.3%
DevOps	0.0%	0.0%	6.7%
Ansible	0.0%	0.0%	0.0%
Apache Cassandra	0.0%	0.0%	0.0%
Apache Solr	0.0%	0.0%	0.0%
Chef/Opscode	0.0%	0.0%	0.0%
Cloud security	0.0%	0.0%	0.0%
Docker	0.0%	0.0%	0.0%
Elasticsearch	0.0%	0.0%	0.0%
Microsoft Azure	0.0%	0.0%	0.0%
Mobile security	0.0%	0.0%	0.0%
MySQL	0.0%	0.0%	0.0%
Node.js	0.0%	0.0%	0.0%
Puppet	0.0%	0.0%	0.0%
Python	0.0%	0.0%	0.0%
Social Media/Networks	0.0%	0.0%	0.0%
SQL	0.0%	0.0%	0.0%
Mobile device management	0.0%	0.0%	0.0%
Big Data analytics	0.0%	0.0%	-14.3%
Cybersecurity	0.0%	-5.9%	-5.9%
Change Management	-5.9%	-5.9%	0.0%
Business intelligence	-7.1%	0.0%	0.0%
Cloud architecture	-7.7%	-7.7%	-7.7%
SAP HANA (In-Memory Analytics Appliance)	-7.7%	-7.7%	-7.7%
Google Cloud Platform	-10.0%	-10.0%	-10.0%
Salt	-11.1%	-11.1%	14.3%
Mobile applications development	-11.1%	-11.1%	-11.1%
GitLab	-12.5%	0.0%	0.0%
Front End Development	-18.7%	na	na
CoreOS	-22.2%	-30.0%	-12.5%

Source: Foote Partners, *2017 IT Skills and Certifications Pay Index™*

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

Popularity of Agile Compensation and People Architecture practices as a solution to persistent IT labor problems.
What's changed is not just the widespread acceptance of technology's role as an engine of innovation and competitiveness but the energized role that is being thrust upon technology professionals and IT organizations everywhere: *monetizing technology* through enabling and leading the development of new products and services. Too often those in the C-suite have been reluctant to hold their IT leaders accountable for such a heavy responsibility, instead choosing to hire expensive consulting firms to do what they believed their IT leaders and tech workers are not capable of doing.

Senior business management may still bring in outside help but they now ask their tech leaders as well as their business line leaders managing large segments of technology talent to be more accountable for architecting, building and securing new products and services that are largely technology based. These tech managers are being held accountable for higher levels of information and tech management ; their performance is being more closely scrutinized. Examples include advanced analytics (for making more informed decisions), greater security (for customers whose sensitive information flows across enterprise networks), and capitalizing on fast moving trends such as cloud computing, virtualization, mobile platforms, exponential energy tech, digital engagement, and of course the Internet of Things. Meanwhile the imperative to streamline operations, reduce costs in every possible manner, and ensure compliance with countless regulation must still be met.

Taken together this has placed tremendous pressure on tech leadership to execute flawlessly and predictably in unfamiliar areas. For many employers this can only be achieved with a dramatic transformation of the IT workforce to a more appropriately skilled group of professionals who are capable of a level of agility, flexibility and aptitude not commonly associated with their predecessors. Companies must be able to *architect their human capital* to meet business needs now and in the future.

What is Agile Compensation and People Architecture?

Agile Compensation is the answer to the chaos created by the proliferation of technology related job titles and lack of consistency in job definition and pay programs across the enterprise for the same work performed. People Architecture is similar in principle to traditional IT architecture initiatives but applied instead to workforce management and IT human capital. There are strategy and capability roadmaps, phase gate blueprints, benchmarks, performance metrics, and stakeholder management. Governance issues need careful attention and business strategy drives it all. But with Agile Compensation and People Architecture it's about how key human capital management (HCM) elements such as job definition and design, skills demand and acquisition, compensation, incentives and recognition, professional development, and work/life balance plug into an overall optimized operational model. The model is tuned to new technologies, business strategy, organizational goals, and culture and performance philosophies, and it promotes flexibility and scalability, like any disciplined architecture approach.

For employers, Agile Compensation and People Architecture has solved these problems:

- Reduces by 50% to 70% the number of tech related job titles necessary to plan and administer pay;
- Significantly increases retention rates;
- Narrowed or altogether eliminated persistent technology skills gaps;
- Improved individual and team performance and more predictable execution,
- More consistent availability and quality of skills and workers
- Higher utilization rates,
- Mapping out how workers can move more effectively through promotions/career paths

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TRENDS DISCUSSION AND ANALYSIS, cont'd.

What is Agile Compensation, cont'd.

Technical architecture practices have been successful because—when done well---companies achieved an understanding of what they have systems-wise and could then connect it to where they were going and how they were going to get there, all within a process inclusive of all the various stakeholders who shared the risk in the outcome. They helped to clearly define enterprise technology capabilities and give companies more options and flexibility going forward. This is exactly what is needed in managing IT human capital.

Tech management is having difficulty finding and retaining people that can perform at a high caliber on increasingly more difficult tasks and at the same time they're feeling immense performance pressure. Plus, today the IT workforce today is spread throughout the enterprise doing multidimensional jobs that are hard to categorize, price and manage. In this environment, many IT leaders and business executives have come to see the architecting of people management as the next logical frontier.

One of the problems corrected by people architecture is the lack of job title standardization in the marketplace and too many job titles floating around IT departments. With so many dimensions and variability in IT jobs, employers have gotten lost from an HR perspective. They're unable to cope with the complexity of defining, determining pay, and laying out career paths for all these jobs. For many, serious retention and hiring problems are showing up for the first time. "Work around solutions used for years to cope with systemic weaknesses in their people management systems have stopped working. Recruiters start picking off your best people and candidates are suddenly rejecting offers. Tensions are palpable in the IT workforce and this IT reality is pervasive.

Right now employers desperately need to incorporate in IT human capital management systems and practices the same straightforward, inclusive architecture approach already being used in other areas of their businesses. This can go a long way toward not just lessening staffing shortages but also executing more predictably and being more agile in face of constant uncertainties and the accelerating pace of change. Ultimately this translates into a more effective workforce whether they are full timers or the contingent workforce of part timers, consultants, and contractors.

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IT Skills & Certifications Pay Data Trend Charts

IT Skills and Certifications Pay Index™ – 1st Quarter 2017 data edition

(Data collected through April 1, 2017)

Certifications versus Noncertified IT skills: 2007 to 2017 – Pg 23

Notable Market Value Gains: Certified and Noncertified IT skills:- Pg. 23

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How to interpret gains and losses in IT skills and certifications pay premiums

Quarterly gains and losses in premium pay reflect a widening or narrowing, respectively, in the gap between supply and demand for skills and certifications. This may occur for any number of reasons. For example, a quarterly decline in pay for a skill may signal that the market supply of talent for that skill is catching up to demand—not necessarily that demand is starting to wane. IT professionals are often attracted to a skill or certification if they perceive that it has rising value in the marketplace and therefore can help them to achieve higher pay, greater job security, a promotion , or more flexibility in their career choices. As they pursue greater competency in that skill or as more workers attain certification, supply increases and market pricing(which is elastic to the laws of supply and demand) will be driven downward unless demand is rising at the same proportional rate. Conversely, if demand rises and supply is not increasing to match that level of demand, pay premiums for specific skills and certifications will increase.

Therefore when interpreting gains and losses in market pay it is important to consider all factors that could be driving supply and demand and market perception. Those factors range from:

- aggressive marketing of certifications by vendors;
- changes in certification programs (e.g. certification extensions or retirement);
- new technology and evolution/maturation of current technologies;
- technology adoption rate;
- product integration strategies,
- economic conditions;
- employment opportunities;
- mergers/acquisitions;
- budget cycles and the timing of skills and talent acquisition by employers;
- changes in labor sourcing plans pursuant to company strategies.

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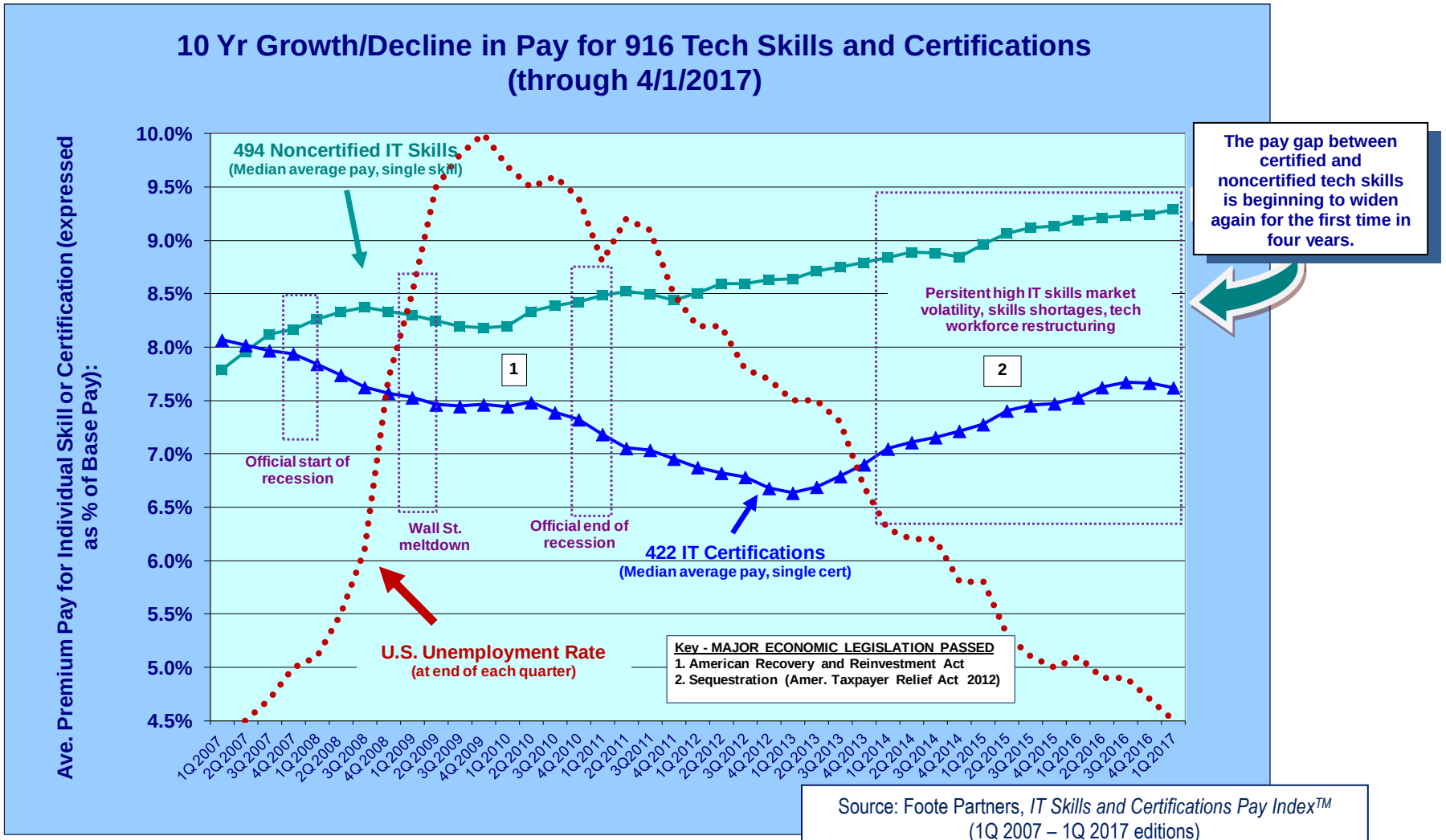
Fig 2 - Premium Pay for Certified and Noncertified IT Skills Has Become a Popular Component of IT Compensation as IT Organizations Transform Themselves

(Average Median Pay for a Single Certified vs. Noncertified IT Skill, Last 8 years – 72,120 tech professionals)



The pay gap between certified and noncertified tech skills is beginning to widen again for the first time in four years.

Source: Foote Partners, *IT Skills and Certifications Pay Index™* (1Q 2007 – 1Q 2017 editions)

(Pay data supporting these charts available in the 2017 *IT Skills and Certifications Pay Index™*.)

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IT CERTIFICATION PAY TREND HIGHLIGHTS: Market Value Gainers

These certified IT skills ***gained 10% or more in market value in the 3 month period ending April 1, 2017***.
Listed in **descending order of amount of gain**, including ties.

IT CERTIFICATION Gainers

Architecture, Project Management and Process certifications
Certified Business Analysis Professional (CBAP)

Application Development/Programming Languages
Oracle Certified Master - Java EE Enterprise Architect
Oracle Certified Expert - Siebel CRM Business Analyst
Microsoft Certified Solution Developer (MCSD)

Database certifications
Oracle Certified Professional – DBA

IT Security certifications
InfoSys Security Engineering Professional (ISSEP/CISSP)
Systems Security Certified Practitioner
Cisco Certified Network Professional - Security
GIAC Certified Intrusion Analyst
GIAC Certified Perimeter Protection Analyst
Check Point Certified Security Master

Networking and Communications certifications
BICSI ITS Technician
Juniper Networks Certified Internet Specialist (JNCIS)
Avaya Certified Solutions Specialist (ACSS)
Cisco Certified Design Expert (CCDE)

Systems Administration certifications
CompTIA Server+
Microsoft Certified Solutions Associate(all)
Novell Certified Linux Professional
Red Hat Certified Engineer(RHCE)
Novell Certified Linux Engineer (CLE)
VMware Certified Professional 6 - Data Center Virtualization (VCP6-DCV)

General/Foundation level and Training
Microsoft Certified Trainer

Source: *IT Skills and Certifications Pay Index™* – Q2 2017 edition

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IT CERTIFICATION PAY TREND HIGHLIGHTS: Market Value Losers

These certified IT skills ***declined 10% or more in market value in the calendar quarter ending April 1, 2017*** vs. prior quarter (by segment).
Listed in ***descending order of amount of decline***, including ties.

IT CERTIFICATIONS Losers

Architecture, Project Management, and Process Certifications
Certified Associate in Project Management (CAPM)
Six Sigma Black Belt
Certified in the Governance of Enterprise IT (CGEIT)

Database
Microsoft Certified Solutions Expert: Data Management and Analytics

IT Security certifications
GIAC Certified Forensics Examiner
Check Point Certified Security Administrator
GIAC Certified Forensics Analyst
GIAC Exploit Researcher and Advanced Penetration Tester
EC-Council Certified Security Analyst
EC-Council Licensed Penetration Tester
InfoSys Security Management Professional (ISSMP/CISSP)
GIAC Reverse Engineering Malware
Certified Forensic Computer Examiner
GIAC Security Essentials
Certified in Risk and Information Systems Control
GIAC Enterprise Defender
CompTIA Security+

Systems Administration certifications
RedHat Certified Technician
HP Accredited Technical Professional (ATP - all)
VMware Certified Advanced Professional – Cloud Infrastructure Administration
VMware Certified Advanced Professional – Cloud Infrastructure Design
HP ASE - Storage Solutions Architect V1 /V2
Microsoft Certified Solutions Expert: Private Cloud
HP ASE – Cloud Integrator V2
HP ASE - Data Center and Cloud Architect V2/V3
VMware Certified Advanced Professional – Data Center Administration
VMware Certified Advanced Professional – Data Center Design
HP/Accredited Integration Specialist
Novell Identity Manager Administrator
VMware Certified Advanced Professional
Red Hat Certified Systems Administrator

Networking & Communication certifications
CompTIA Network+

Applications Development/Programming Languages
Microsoft Certified Professional Developer (all)
Oracle Certified Master - Java SE Developer
Siebel 8 Consultant Certified Expert
Microsoft Certified Technology Specialist: Microsoft Dynamics CRM

Source: *IT Skills and Certifications Pay Index™ – Q2 2017 edition*

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NONCERTIFIED IT SKILLS TREND HIGHLIGHTS: Market Value Gainers

These noncertified IT skills ***gained 10% or more in market value in the calendar quarter ending April 1, 2017*** versus prior quarter.
Listed in **descending order of amount of gain**, including ties.

IT SKILLS (noncertified) Gainers

Applications Development skills
CA PPM(Clarity PPM)
Scrum
PowerBuilder
Delphi
Apache Struts/Struts2
WebSphere MQ (MQSeries)

Management, Process & Methodology skills
Social media analytics
QlikView
Data Science
E-Procurement

Web/SOA/E-Commerce skills
Magnolia
JavaFX
XML (all variants)
Oracle Fusion

SAP/ERP skills
SAP MRS (Multi Resource Scheduling)
SAP SM (Service Management)
SAP AFS (Apparel and Footwear Solutions)
SAP CS (Customer Service)
Oracle SCM (Supply Chain Management)
PeopleSoft (CRM/Financials/HCM)
Baan
Oracle Eloqua
SAP WM - EWM (Extended Warehouse Management)
SAP CO-PA (Profitability Analysis)
SAP FI - FSCM (Financial Supply Chain Management)
SAP PSCD (Collection and Disbursement)
SAP GTS (Global Trade Services)
SAP ALE (Application Link Enabling)
SAP Business One
SAP Business Workflow/Webflow
ABAP
Web Dynapro
SAP FI - CA (Contract Accounting)

Messaging & Communications skills
Unified communications/messaging
RabbitMQ

Operating Systems/Systems Software Skills
Windows NT
Windows Server 2012/2008

Systems/Networking skills
Novell Netware
Storage virtualization/administration
Tivoli
Gigabit Ethernet (1 GigE/10 GigE)
TCP/IP
Business continuity and disaster recovery planning
Rackspace Cloud
Citrix XenServer
Network access control/Identity mgt sys.

Source: *IT Skills and Certifications Pay Index™* – Q2 2017 edition

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NONCERTIFIED IT SKILLS TREND HIGHLIGHTS: Market Value Losers

These certified and noncertified skills ***declined 10% or more in market value in the calendar quarter ending April 1, 2017*** vs. prior quarter (by segment).
Listed in *d**escending order of amount of decline***, including ties.

IT SKILLS (Noncertified) Losers

Applications Development skills
Cerner Millennium
GitLab
Apache Cordova
Microsoft SQL Server Management Studio
Automated Testing
MATLAB
SaaS
Cognos
Xcode
Microsoft Azure

Management, Process & Methodology
Requirements Engineering/Analysis
Data Quality
Data Management
IT Governance
Penetration testing
Risk analytics/assessment
Data Governance

SAP & Enterprise Business Applications skills
SAP BODI (Business Objects Data Integrator)
SAP SRM (Supplier Relationship Management)
SAP IS-U (Utilities)
SAP Banking
SAP CRM (Customer Relationship Management)
SAP HCM (SAP HR)
Oracle HRMS
SAP MII (Manufacturing Integration and Intelligence)
Lawson
SAP ERP Operations (multi-skills)
SAP Security
SAP GRC (Governance, Risk, and Compliance)
SAP Lumira
SAP Data Services (SAP BODS)
SAP NWDS (NetWeaver Studio)
SAP HANA (In-Memory Analytics Appliance)
SAP Fiori

Message & Communications skills
TIBCO Enterprise Message Service

Systems/Networking skills
LTE/WiMAX
HP Quality Center
Mobile device management
VoIP/IP telephony
Network security management
Vagrant
Wireless sensors/RFID
Juniper
PaaS
Salt
Virtualization (various)
IaaS (Infrastructure as a Service)
Cisco Nexus
Ansible
Cisco IPCC

Web/E-commerce Development skills
Apache Solr
jQuery
XHTML MP
Microsoft Commerce Server
Front End Development
JSON
Mobile applications development
JBoss
Oracle WebLogic
UDDI (Universal Description, Discovery and Integration

Source: *IT Skills and Certifications Pay Index™ – Q2 2017 edition*

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IT Skills & Certifications Pay Performance Trend Charts

IT Skills and Certifications Pay Index™ – 1st Quarter 2017 data edition

(Data collected through April 1, 2017)

- **IT Certifications** (page 28)
- **Noncertified IT skills** (page 34)
- **IT Skills & Certifications Volatility Index™** (page 40)

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IT Certifications: Latest market value trends

(Data collected through April 1, 2017)

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2-YEAR IT CERTIFICATIONS PAY TRENDS

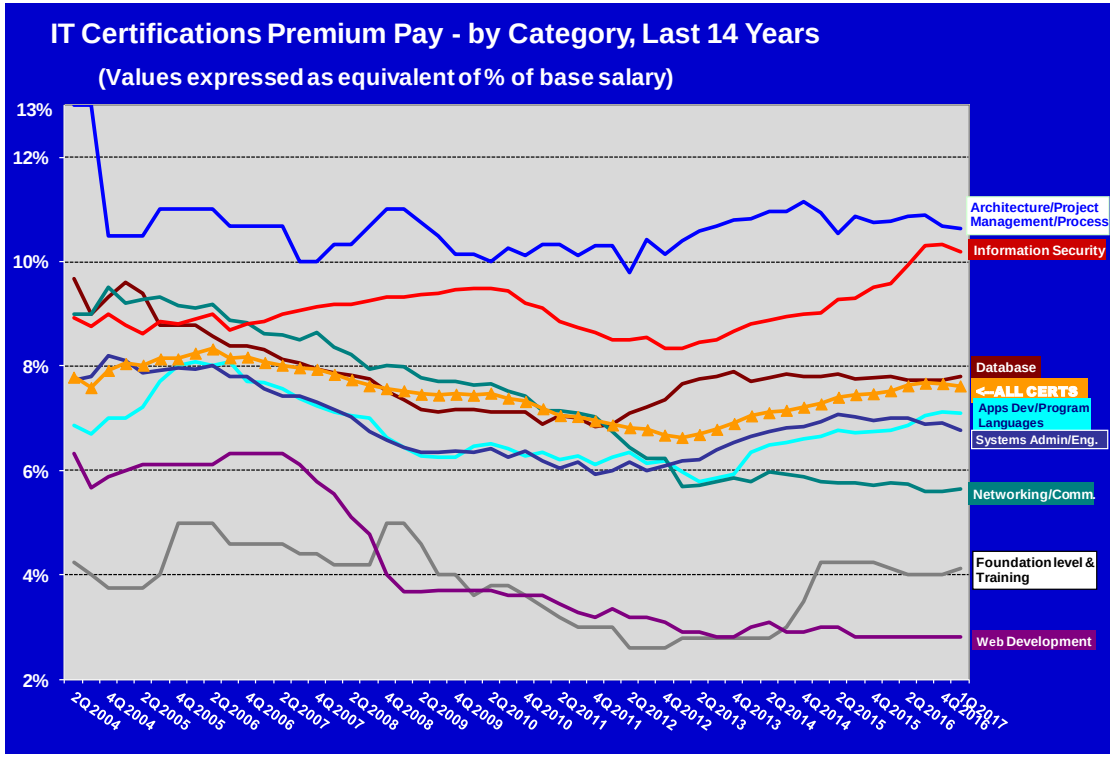
(Through 4/1/2017 – 72,120 IT Professionals)

IT CERTIFICATIONS CATEGORIES	# of certs surveyed	Change in Average Premium Pay by Category			
		% Change 3 mos	% Change 6 mos	% Change ANNUAL	% Change 2 yrs
Foundation level and Training	8	3.1%	3.1%	0.0%	-2.9%
Apps Development/Prog. Languages	46	-0.6%	0.6%	4.7%	6.6%
Database	40	0.9%	0.8%	-0.1%	0.0%
Web Development	11	0.0%	0.0%	0.0%	-6.1%
Networking & Communications	86	0.6%	0.6%	-2.0%	-2.7%
System Administration/Engineering	101	-2.1%	-1.5%	-3.4%	-2.5%
Information/Cyber Security	83	-1.4%	-1.0%	6.4%	13.1%
Architecture/Project Management/Process	47	-0.4%	-2.3%	-1.1%	-2.7%
ALL CERTIFICATIONS REPORTED	422	-0.57%	-0.68%	1.24%	4.74%

IT CERTIFICATIONS PAY TRENDS BY CATEGORY

Average Median Pay for a Single IT Certification

(Through 4/1/2017 – 72,120 IT Professionals)



(Pay data supporting these charts available in the *IT Skills and Certifications Pay Index™* – 2Q 2017 edition)

SOURCE: Data supporting these charts is from Foote Partners *IT Skills & Certifications Pay Index™* (2004 to 2017 quarterly editions)

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HIGHEST PAYING IT Certifications (ranked, all 422 certs surveyed)

These **IT certifications** are among those earning the highest pay premiums (data collected January 1, 2017 to April 1, 2017). **Shown in alphabetical by overall rank in descending order including ties.** **Green**/**Red** = increased/decreased in market value this quarter. **Amber** = Just made the list this quarter

1. Certified Cyber Forensics Professional
Open Group Master Architect
InfoSys Security Engineering Professional (ISSEP/CISSP

2. Six Sigma Master Black Belt
CyberSecurity Forensic Analyst (CSFA)
TOGAF 9 Certified

3. Tie Check Point Certified Security Master (CCMA)
EC-Council Certified Incident Handler
GIAC Secure Software Programmer—Java
GIAC Web Application Penetration Tester (GWAPT)
Open Group Master Certified IT Specialist
PMI Professional in Business Analysis (PMI-PBA)
PMI Program Management Professional (PgMP)

4.Tie Certified Business Analysis Professional (CBAP)
Cisco Certified Architect
EC-Council Computer Hacking Forensic Investigator (CHFI)
GIAC Certified Penetration Tester (GPEN)
GIAC Systems and Network Auditor (GSNA)
InfoSys Security Architecture Professional (ISSAP/CISSP)
PMI Agile Certified Practitioner (PMI-ACP)
PMI Portfolio Management Professional (PfMP)
PMI Project Management Professional(PMP)
PMI Risk Management Professional (PMI-RMP)
Salesforce.com Certified Technical Architect

5.Tie Certified Information Security Manager (CISM)
Certified Information Systems Auditor (CISA)
Certified Information Systems Security Professional (CISSP)
Certified Scrum Master
GIAC Assessing Wireless Networks
GIAC Certified Intrusion Analyst (GCIA)
GIAC Certified Perimeter Protection Analyst (GPPA)

5.Tie GIAC Enterprise Defender (GCED)
Open Group Certified Architect
Open Group Certified IT Specialist (Open CITS)

6.Tie AWS Certified Solutions Architect - Professional (Cloud)
Certified Cloud Security Professional
Certified Computer Examiner (CCE)
Certified Forensic Computer Examiner (CFCE)
Certified Fraud Examiner
Certified in the Governance of Enterprise IT (CGEIT)
Certified in Risk and Information Systems Control (CRISC)
Certified IT Architect (IASA CITA)
Certified Secure Software Lifecycle Professional (CSSLP)
Cloudera Certified Professional: Data Scientist
CSX CyberSecurity Practitioner (CSXP)
EC-Council Certified Ethical Hacker (CEH)
EC-Council Certified Security Analyst (ECSA)
EMC Cloud Architect Expert
GIAC Certified Forensics Analyst (GCFA)
GIAC Certified Incident Handler (GCIH)
GIAC Exploit Researcher and Advanced Penetration Tester
SAS Certified Data Scientist
VMware Certified Design Expert - Cloud (VCDX-Cloud)

7.Tie AWS Certified DevOps Engineer - Professional
Certified Healthcare Information Security and Privacy Practitioner (ISC2)
Certified Information Privacy Technologist- all countries
Certified Manager of Software Quality (CMSQ)
Check Point Certified Security Expert (CCSE)
Cisco Certified Network Professional - Security
Cloudera Certified Developer for Apache Hadoop
EC Council Certified Network Defense Architect Certification
GIAC Reverse Engineering Malware
HPE ASE--Data Center and Cloud ArchitectV1
Systems Security Certified Practitioner (SSCP)

SOURCE: Foote Partners *IT Skills & Certifications Pay Index™*, 1st Quarter 2017 data edition

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422 IT Certifications Reported

(new this quarter in red)

Avaya Certified Implementation Specialist
Avaya Certified Professional Design Specialist
Avaya Certified Solution Specialist
AWS Certified Solutions Architect – Associate
AWS Certified Solutions Architect – Professional
AWS Certified SysOpsAdministrator-Associate
AWS Certified Developer – Associate
AWS Certified DevOps Engineer - Professional
BICSI ITS Technician
Brocade Certified Network Engineer
Brocade Certified Network Professional
Brocade Certified Fabric Designer
Brocade Certified Fabric Professional (BCFP)
Certificate of Cloud Security Knowledge
Certification of Competency in Business Analysis
Certified Analytics Professional (CAP)
Certified Associate in Project Management)
Certified Business Analysis Professional (CBAP)
Certified Business Continuity Professional (CBCP)
Certified Cloud Architect
Certified Cloud Security Professional
Certified Cloud Technology Professional
Certified Computer Examiner (CCE)
Certified Computing Professional (CCP-ISC2)
Certified Cyber Forensics Professional
Certified in Convergent Network Technologies (CCNT)
Certified Database Design Specialist
Certified Data Centre Management Professional
Certified Data Management Professional
Certified Disaster Recovery Engineer (C/DRE)
Certified Forensic Computer Examiner
Certified Fraud Examiner
Certified Healthcare Information Security and Privacy Practitioner (ISC2)
Certified Salesforce Developer
Certified Salesforce Advanced Developer
Certified in the Governance of Enterprise IT (CGEIT)
Certified in Risk and Information Systems Control
Certified Information Security Manager (CISM)
Certified Information Systems Auditor (CISA)
Certified Information Systems Security Professional
Certified IT Architect (IASA CITA)
Certified IT Compliance Professional
Certified Manager of Software Quality (CMSQ)
Certified Protection Professional
Certified Secure Software Lifecycle Professional
Certified Software Quality Analyst (CSQA)
Certified Technical Architect (Salesforce.com)
Certified Telecommunications Network Specialist
Check Point Certified Master Architect (CCMA)
Check Point Certified Security Administrator (CCSA)
Check Point Certified Security Expert (CCSE)
Certified Cisco Systems Instructor (CCSI)
Cisco ASA Specialist
Cisco Certified Architect
Cisco Certified Design Associate (CCDA)
Cisco Certified Design Expert (CCDE)
Cisco Certified Design Professional (CCDP)
Cisco Certified Entry Network Technician (CCENT)
Cisco Certified Internetwork Expert (CCIE)
Cisco Certified Internetwork Professional (CCIP)
Cisco Certified Network Associate (CCNA)
Cisco Certified Network Associate - Data Center
Cisco Certified Network Associate - Security
Cisco Certified Network Associate - Voice
Cisco Certified Network Associate Wireless
Cisco Certified Network Professional Wireless
Cisco Certified Network Professional (CCNP)
Cisco Certified Network Professional - Data Center
Cisco Certified Network Professional - Security
Cisco Certified Network Professional Voice
Cisco Certified Systems Instructor (CCSI)
Cisco Data Center Networking Infrastructure Support Specialist
Cisco Data Center Unified Computing Design Specialist
Cisco Data Center Unified Computing Support Specialist
Cisco Data Center Unified Fabric Design Specialist
Cisco Data Center Unified Fabric Support Specialist
Cisco Firewall Security Specialist
Cisco IP Communications Express Specialist
Cisco IP Contact Center Express Specialist (CPCC)
Cisco IP Telephony Design Specialist
Cisco IP Telephony Support Specialist
Cisco IPS (Intrusion Prevention System) Specialist
Cisco Network Admission Control Specialist
Cisco VPN Specialist
Citrix Certified Administrator-Networking (CCA)
Citrix Certified Associate - Virtualization
Citrix Certified Expert - Virtualization
Citrix Certified Expert - Apps and Desktops
Citrix Certified Instructor (CCI - Virtualization, Networking, or Mobility)
Citrix Certified Professional – Mobility (CCP-M)
Citrix Certified Professional – Networking
Citrix Certified Professional-Virtualization (CCP-V)
CIW Associate
CIW Certified Database Design Specialist
CIW Network Technology Associate
CIW Web Design Professional
CIW Web Development Professional
CIW Web Foundations Associate
Master CIW Administrator
Cloud U (Rackspace)
Master CIW Designer
Master CIW Enterprise Developer
Master CIW Web Site Manager
Cloudera Certified Developer for Apache Hadoop
Cloudera Certified Administrator for Apache Hadoop
Cloudera Certified Professional: Data Scientist
Cloudera Certified Specialist in Apache HBase
CompTIA Advanced Security Practitioner (CASP)
CompTIA Certified Technical Trainer (CTT+)
CompTIA Cloud Essentials
CompTIA Cloud+
CompTIA/Linux Administrator (Linux+)
CompTIA Mobility+
CompTIA Mobile App Security+
CompTIA/Network (Network+)
CompTIA Project+
CompTIA Security+
CompTIA Server+
CompTIA Storage+
Convergence Technologies Professional (CTP)
CSX CyberSecurity Practitioner (CSXP
CWNP Certified Wireless Analysis Professional
CWNP/Certified Wireless Design Professional
CWNP Certified Wireless Network Administrator
CWNP Certified Wireless Network Expert (CWNE)
CWNP Certified Wireless Network Trainer
CWNP Certified Wireless Security Professional
CWTS/Certified Wireless Technology Specialist
CyberSecurity Forensic Analyst
EC-Council Certified Network Defense Architect Certification
EC-Council Certified Ethical Hacker (CEH
EC-Council Computer Hacking Forensic Investigator (CHFI)
EC-Council Certified Secure Programmer (ECSP)
EC-Council Certified Security Analyst
EC-Council Disaster Recovery Professional (EDRP)
EC-Council Licensed Penetration Tester (LPT)
EC-Council Network Security Administrator (ENSA)
EC-Council Certified VoIP Professional (ECVP)
EMC Cloud Architect Associate
EMC Cloud Architect Expert (IT-as-a-Service)
EMC Cloud Architect Specialist (Virtualized Information Infrastructure)
EMC Data Science Associate
EMC Data Science Specialist, Advanced Analytics
EMC Implementation Engineer – Specialist
EMC Implementation Engineer - Expert
EMC Platform Engineer – Specialist
EMC Storage Administrator – Expert
EMC Storage Administrator – Specialist
EMC System Administrator – Specialist
EMC Technology Architect – Expert
EMC Technology Architect – Specialist
HDI Customer Service Representative
HDI Desktop Support Manager
HDI Desktop Support Technician
HDI Support Center Analyst
HDI Support Center Director
HDI Support Center Manager
HDI Support Center Team Lead
HDI Technical Support Professional
Help Desk Analyst: Tier 1 Support Specialist/Ed2Go
Help Desk Team Lead/RCCSP
HPE Accredited Integration Specialist (AIS)
HPE Accredited Systems Engineer--Cloud Architect V2
HPE Accredited Systems Engineer--Cloud IntegratorV2
HPE Accredited Technical Professional (ATP – all)
HPE Accredited Technical Professional-Cloud Administrat
HPE/Accredited Solutions Expert (ASE - all)
HPE/Accredited Systems Engineer (ASE)
HPE ASE - Data Center and Cloud Architect V1
HPE ASE - Data Center and Cloud Architect V2/V3
HPE ASE - Storage Solutions Architect V1/V2
HPE Accredited Systems Engineer Vertica Big Data Solutions Administrator V1
HPE Accredited Technical Professional Big Data Vertica Solutions V1
HPE ATP - Cloud Administrator V1
HPE ATP – Storage Solutions V1 /V2
HPE Master Accredited Solutions Expert (MASE - all)
HPE Master ASE - Storage Solutions Architect V1/V2
HPE/Master Accredited Systems Engineer (Master ASE)
HPE Vertica Solutions

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IBM Advanced Systems Administrator (all)
IBM Certified Administrator for SOA Solutions: WebSphere Process Server
IBM Certified Advanced Application Developer (all)
IBM Certified Advanced Database Administrator
IBM Certified Advanced Security Professional
IBM Certified Advanced Technical Expert - Power Systems with AIX v2/v3
IBM Certified Applications Developer (all)
IBM Certified Database Administrator
IBM Certified Developer - Cognos
IBM Certified Infrastructure Systems Architect
IBM Certified Operator - AIX Basic Ops
IBM Certified SOA Solution Designer
IBM Certified Solution Advisor-Cloud Computing Advisor V4
IBM Certified Solution Architect – Cloud Computing Infrastructure V1
IBM Certified Solution Designer – WebSphere
IBM Certified Solution Developer - DB2 SQL
IBM Certified Solution Expert - Cognos
IBM Certified Solutions Developer: WebSphere (al)
IBM Certified Specialist - System z
IBM Certified Specialist – Cognos
IBM Certified Specialist - Storage
IBM Certified Systems Administrator
IBM Certified Systems Administrator - AIX 7
IBM Certified Systems Administrator - IBM i 6.1
IBM Certified Systems Administrator – WebSphere
IBM Certified Systems Expert - AIX and Linux v2 (all)
IBM Certified Systems Expert - Virtualization Technical Support for AIX and Linux - v2
IBM Certified Advanced Technical Expert - Power Systems with AIX v2
InfoSys Security Architecture Professional (ISSAP/CISSP)
InfoSys Security Engineering Professional (ISSEP/CISSP)
InfoSys Security Management Professional (ISSMP/CISSP)
ITIL Practitioner Certificate in IT Service Management
ITIL Service Manager Certification
JBoss Certified Developer (Seam, Persistence, ESB)
Juniper Networks Certified Internet Associate
Juniper Networks Certified Internet Specialist
Juniper Networks Certified Internet Professional
Juniper Networks Certified Internet Expert
Linux Professional Institute certification (Level 2)
Linux Professional Institute certification (Level 3)
Microsoft Certified Master/Solutions Master(all)
Microsoft Certified Applications Developer (MCAD)
Microsoft Certified Architect
Microsoft Certified Desktop Support Technician (MCDST)
Microsoft Certified IT Professional (MCITP/all)
Microsoft Certified IT Professional: DBA
Microsoft Certified Professional Developer (all)
Microsoft Certified Solution Developer: Applications Lifecycle Management
Microsoft Certified Solution Developer (MCSD)
Microsoft Certified Solutions Associate(all)
Microsoft Certified Solutions Associate: SQL Server 2012
Microsoft Certified Solutions Expert(all)
Microsoft Certified Solutions Expert: Business Intelligence
Microsoft Certified Solutions Expert: Data Platform
Microsoft Certified Solutions Expert: Data Management and Analytics
Microsoft Certified Solutions Expert: Desktop Infrastructure
Microsoft Certified Solutions Expert: Private Cloud
Microsoft Certified Solutions Expert: Server Infrastructure
Microsoft Certified Solutions Expert: Communications
Microsoft Certified Technology Specialist (all)
Microsoft Certified Technology Specialist: Microsoft Dynamics CRM
Microsoft Certified Technology Specialist: SQL Server 2008
Microsoft Certified Trainer (MCT)
Microsoft MCSA: Security (MCSA: Security)
Microsoft MCSE: Security (MCSE: Security)
Microsoft Office Specialist
Microsoft Specialist Certification in Microsoft Azure
Microsoft Specialist in Windows 10
Mongo DB Certified DBA
Mongo DB Certified Developer
NetApp Certified Data Administrator (NCDA)
NetScout/nGenius Certified Analyst (nCA)
NetScout/nGenius Certified Expert (nCE)
NetScout/nGenius Certified Master (nCM)
NetScout/nGenius Certified Professional (nCP)
Novell Certified Instructor
Novell Certified Linux Engineer (Novell CLE)
Novell Certified Linux Professional (Novell CLP)
Novell/Certified Internet Professional (CIP)
Novell/Certified Novell Administrator (CNA)
Novell/Certified Novell Engineer (CNE)
Novell Identity Manager Administrator
Open Group Certified Architect
Open Group Certified IT Specialist
Open Group Master Architect
Open Group Master Certified IT Specialist
Oracle Administrator Certified Associate - DBA (OCA)
Oracle Administrator Certified Master - DBA (OCM)
Oracle Administrator Certified Professional - DBA (OCP)
Oracle Business Intelligence Foundation Suite 11G Certified Implementation Specialist
Oracle Certified Associate, Java SE Programmer
Oracle Certified Associate, MySQL 5
Oracle Certified Associate, WebLogic Server Administrator
Oracle Certified Expert - MySQL 5.1 Cluster Database Administrator
Oracle Certified Expert - Oracle Solaris 10 Systems Administrator
Oracle Certified Expert - Siebel CRM Business Analyst
Oracle Certified Expert - Java Platform EE Developer
Oracle Certified Expert - Oracle Solaris 10 Network Administrator for Solaris
Oracle Certified Master - Java EE Enterprise Architect
Oracle Certified Master - Java SE Developer
Oracle Certified Professional - Advanced PL/SQL Developer
Oracle Certified Professional - Application Server 10g Administrator
Oracle Certified Professional - Database Cloud Administrator
Oracle Certified Professional - E-Business Suite
Oracle Certified Professional - Java SE Programmer
Oracle Certified Professional - Java EE Web Component Developer
Oracle Certified Programmer - Java EE Web Services Developer
Oracle Certified Professional - MySQL 5.0 Database Administrator
Oracle Certified Professional - MySQL 5.0 Developer
Oracle Certified Professional - Oracle Solaris 10 Systems Administrator for Solaris
Oracle Certified WebLogic Server System Administrator Expert
Oracle Enterprise Manager
Oracle Exadata 11g Certified Implementation Specialist
Oracle Forms Developer Certified Professional
Oracle Linux Certified Administrator (OCA)
Oracle PL/SQL Developer Certified Associate
Oracle SOA Infrastructure Implementation Certified Expert
Oracle VM 3.0 for x86 Certified Implementation Specialist
Pegasystems Certified System Architect
Pegasystems Certified Senior Systems Architect
Pegasystems Certified Lead System Architect
PMI Agile Certified Practitioner (PMI-ACP)
PMI Program Management Professional (PgMP)
PMI Project Management Professional (PMP)
PMI Risk Management Professional (PMI-RMP)
PMI Portfolio Management Professional (PfMP)
PMI Professional in Business Analysis (PMI-PBA)
Professional Certified Investigator
Red Hat Certificate of Expertise in Infrastructure-as-a-Service
Red Hat Certified Architect (RHCA)
Red Hat Certified Architect:- Cloud
Red Hat Certified Architect:- DevOps
Red Hat Certified Datacenter Specialist (RHCDS)
Red Hat Certified Engineer (RHCE)
Red Hat Certified Engineer in Red Hat OpenStack
Red Hat Certified Security Specialist (RHCSS)
Red Hat Certified System Administrator in Red Hat OpenStack
Red Hat Certified Systems Administrator
Red Hat Certified Technician (RHCT)
RedHat Certified Virtualization Administration
Qualified Information Security Professional Q/ISP
RSA Certified Administrator (RSA/CA)
RSA Certified Instructor (RSA/CI)
RSA Certified Systems Engineer (RSA/CSE)
SANS/GIAC Assessing Wireless Networks
SANS/GIAC Auditing Wireless Networks
SANS/GIAC Certified Firewall Analyst
SANS/GIAC Certified Forensic Analyst
SANS/GIAC Certified Forensics Examiner
SANS/GIAC Certified Incident Handler
SANS/GIAC Certified Intrusion Analyst
SANS/GIAC Certified Penetration Tester
SANS/GIAC Certified Perimeter Protection Analyst
SANS/GIAC Certified Project Manager

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SANS/GIAC Certified Security Essentials
SANS/GIAC Certified Unix Security Admin
SANS/GIAC Certified Windows Security Admin
SANS/GIAC Certified Web Application Defender
SANS/GIAC Enterprise Defender
SANS/GIAC Exploit Researcher and Advanced Penetration Tester
SANS/GIAC Information Security Professional
SANS/GIAC Information Security Fundamentals
SANS/GIAC Legal Issues in Information Technology and Security
SANS/GIAC Mobile Device Security Analyst
SANS/GIAC Reverse Engineering Malware
SANS/GIAC Secure Software Programmer—Java
SANS/GIAC Security Essentials
SANS/GIAC/Security Leadership
SANS/GIAC Systems and Network Auditor
SANS/GIAC Web Application Penetration
Salesforce.com Certified Technical Architect
SAS Certified Advanced Programmer
SAS Certified Base Programmer
SAS Certified Big Data Professional Using SAS 9
SAS Certified Data Integration Developer for SAS 9
SAS Certified Data Scientist
SAS Certified Predictive Modeler-SAS Enter. Miner 7
SAS Certified Statistical Business Analyst – SAS 9
SAS Certified Big Data Professional Using SAS 9
SAS Certified Data Scientist
Security Certified Network Architect (SCNA)
Security Certified Network Specialist (SCNS)
Siebel 8 Consultant Certified Expert
Six Sigma Black Belt
Six Sigma Master Black Belt
SNIA Certified Storage Architect
SNIA Certified Storage Networking Expert (SCSN-E)
SNIA Certified Storage Professional
SNIA Certified Systems Engineer Sniffer Certified Expert
SolarWinds Certified Professional (SCP)
Sun Certifications (SEE ORACLE)
Systems Security Certified Professional (SSCP)
Teradata 12 Certified Associate
Teradata 12 Certified Database Administrator
Teradata 12 Certified Enterprise Architect
Teradata 12 Certified Master
Teradata 12 Certified Professional
Teradata 12 Certified Solutions Developer
Teradata 12 Certified Technical Specialist
TIBCO Certified Professional
TIBCO Certified SOA Architect
TOGAF 9 Certified
VMware Certified Advanced Professional
VMware Certified Advanced Professional – Cloud Infrastructure Design (VCAP-CID)
VMware Certified Advanced Professional – Cloud Infrastructure Administration (VCAP-CIA)
VMware Certified Associate - Workforce Mobility (VCA-WM)
VMware Certified Associate - Cloud (VCA-Cloud)
VMware Certified Design Expert (VCDX)
VMware Certified Design Expert - Cloud (VCDX-Cloud)
VMware Certified Design Expert 5 - Data Center Virtualization (VCDX5-DCV)
VMware Certified Professional (VCP)
VMware Certified Professional-Cloud (VCP6-Cloud)
VMware Certified Professional 5 - Data Center Virtualization (VCP5-DCV)
VMware Certified Professional 6 - Data Center Virtualization (VCP6-DCV)

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IT Skills (Noncertified): Latest market value trends

(Data collected through April 1, 2017)

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2-YEAR NONCERTIFIED IT SKILLS PAY TRENDS

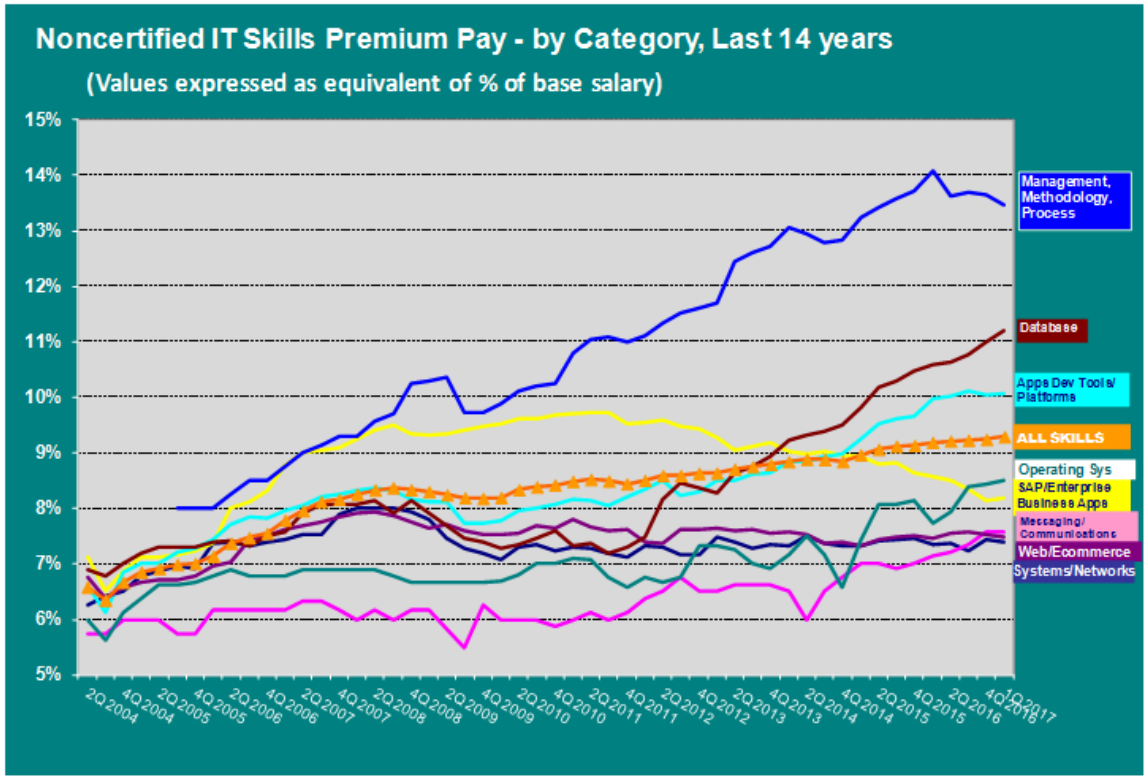
(Through 4/1/2017 – 72,120 IT Professionals)

NONCERTIFIED IT SKILLS CATEGORIES	# of skills surveyed	Change in Average Premium Pay by Category			
		% Change 3 mos	% Change 6 mos	% Change ANNUAL	% Change 2 yrs
Systems/Networking	79	-0.3%	2.4%	0.7%	1.0%
Messaging and Communications	14	0.0%	2.9%	6.0%	8.2%
SAP & Enterprise Business Applications	120	0.7%	-1.8%	-4.4%	-8.3%
Apps Development Tools & Platforms	83	0.3%	-0.4%	0.9%	8.7%
Web/e-Commerce Development	74	-0.6%	-1.1%	0.3%	2.1%
Database	42	1.7%	3.9%	5.6%	13.8%
Operating Systems	14	0.8%	1.2%	9.9%	14.4%
Management/Methodology/Process	68	-1.5%	-1.8%	-4.4%	1.6%
ALL NONCERTIFIED SKILLS REPORTED	494	0.5%	0.7%	1.1%	3.7%

NONCERTIFIED IT SKILLS PAY TRENDS BY CATEGORY

Average Median Pay for a Single IT Skill (noncertified)

(Through 4/1/2017 – 72,120 IT Professionals)



(Pay data supporting these charts available in the *IT Skills and Certifications Pay Index™* – 2Q 2017 edition)

SOURCE: Data supporting these charts is from Foote Partners *IT Skills & Certifications Pay Index™* (2004 to 2016 quarterly editions)

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HIGHEST PAYING Noncertified IT Skills (ranked, all 494 skills surveyed)

These **noncertified IT skills** are among those earning the highest pay premiums (data collected January 1, 2017 to April 1, 2017). **Shown in alphabetical by overall rank in descending order including ties.** **Green/Red** = increased/decreased in market value this quarter. **Amber** = Just made the list this quarter.

1. Tie
- Data Architecture
- Prescriptive Analytics
- TOGAF (Enterprise Architecture)

2. Tie
- Complex Event Processing/Event Correlation
- Metadata design and development
- Security architecture and models

3.Tie
- COBIT
- Big Data analytics
- Cybersecurity
- Data Governance
- DevOps
- Infrastructure architecture
- Machine Learning
- Microservices
- Quantitative Analysis/Regression Analysis
- Risk management
- Sqoop
- Zachman Framework

4.Tie
- Blockchain
- Cloudera Impala
- Continuous Integration
- Hbase
- Network Architecture
- Objective Caml (Ocaml)
- Predictive Analytics and Modeling
- Program Management
- Risk analytics/assessment
- Security skills (DW/BI, ERP, Web, project
- TIBCO ActiveMatrix BusinessWorks
- User Experience/Interface Design

5. Tie
- Apache Cloudstack
- Apache Hive
- Apache Spark
- Configuration Management

5Tie
- Cryptography (encryption, VPN, SSL/TLS, Hybrids)
- Data Analytics
- Data Integration
- Data Modelling
- Information management
- IT Governance
- Kanban
- MapReduce
- Penetration testing
- Project management/governance
- Six Sigma/Lean Six Sigma
- Splunk
- Workday HCM

6.Tie
- Amazon DynamoDB
- Amazon Lucene
- Amazon RedShift
- Apache Cassandra
- Apache Hadoop
- Apache Pig
- Business analysis
- Capacity Planning/Management
- Change Management
- Clojure
- Couchbase Server
- Data Management
- Data Visualization
- Go language (Golang)
- Master data management
- Mobile security
- Oracle Exadata
- Quality management/TQM
- Riak
- Scala
- Test automation
- Test Driven Development/Scripting
- TIBCO Rendezvous
- VMware Cloud Foundry PaaS

6.Tie
- Waterfall
- Web Analytics
- Web services security
- Webtrends analytics

7.Tie
- Amazon CouchDB
- Apache Flume
- Apache Zookeeper
- AWS Lambda
- Business intelligence
- Business Process Mapping/Modeling/Improvement
- Cloud architecture
- Cloud security
- Cloudera software
- CRM
- Data Quality
- ERP
- F#
- Informatica
- Java Database Connectivity (JDBC
- Marketo
- Microsoft SQL Server Analysis Services
- MongoDB
- NoSQL
- Oracle Applications Developer Framework
- Oracle Coherence
- Oracle Enterprise Manager
- Oracle SCM (Supply Chain Management)
- R language
- Redis
- Requirements Engineering/Analysis
- Scrum
- Secure software development
- Service Management
- Social media analytics
- Software development lifecycle management
- Sybase Adaptive Server Enterprise
- User Acceptance Testing

SOURCE: Foote Partners *IT Skills & Certifications Pay Index™*, 1st Quarter 2017 data edition

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Applic. Dev. Tools/Platforms

Agile Programming/RAD/EP
Amazon Web Services (EC2, S3, ASW, SQS, ELB, et. al.)
Apache Ant
Apache Cordova
Apache Flex
Apache Hadoop
Apache Lucene
Apache Maven
Apache Pig/Pig Latin
Apache Spark
Apache Struts/Struts2
Apache Tomcat
Apache Zookeeper
Automated Testing
AWS CloudFormation
AWS Lambda
Bitbucket
Business Objects
C
C#
C++
C++ /CLI
Cerner Millennium
CA PPM(Clarity PPM)
Clojure
Cloudera software
Cobol
Cognos
Confluence
Cucumber
Delphi
Drupal
Eclipse
Epic Systems applications
F#
Git / GitHub
GitLab
Go language (Golang)
Groovy/Grails
Hibernate
HP ALM
Integration Testing
iRise
Jasmine
Java/J2SE, ME, J2EE
Jenkins
JIRA
JUnit
MapReduce
MATLAB
Microsoft Azure
Microsoft SQL Server Management Studio
Microsoft Team Foundation Server
NetWeaver
Nim
NUnit
Objective Caml (Ocaml)
Objective-C
Oracle Apps Developer Framework
PL/SQL
Powerbuilder
Progress 4GL/Development tools
R language
Ruby
Ruby on Rails
Saas
SAS
Scala
Scrum
Selenium
ServiceNow ITSM
SPSS
SQL Windows
Tcl
Transact-SQL
UML (unified modeling language)
Visual Basic 6.0
Visual C++
VMware Cloud Foundry PaaS
WebSphereMQ
Xcode

SAP & Enterprise Bus. Apps.

ABAP (all modules)
Baan
J.D. Edwards
Lawson
Microsoft Dynamics
NetWeaver
NetWeaver Portal (SAP EP)
Oracle BPM
Oracle CRM
Oracle E-Business suite
Oracle Eloqua
Oracle ERP
Oracle Financials
Oracle HFM
Oracle HRMS
Oracle NetSuite
Oracle Payroll
Oracle Retail
Oracle SCM
Oracle SOA Suite
Pega
PeopleSoft (CRM/Financials/HCM)
Remedy
Salesforce
Accelerated SAP (SLM)
SAP AFS
SAP ALE
SAP APO
SAP Auto-ID infrastructure
SAP Banking
SAP Basis Components
SAP BI Accelerator
SAP BODI
SAP BOXI
SAP BPC
SAP BSP
SAP Business One
SAP Business Workflow/Webflow
SAP CA
SAP CAF
SAP CCM
SAP CE
SAP CFM
SAP CO
SAP CO-PA
SAP CRM
SAP Crystal Reports
SAP CS
SAP Data Services (SAP BODS)
SAP EBP
SAP EDI
SAP EHS
SAP EPM
SAP ERP
SAP ESA
SAP Fiori
SAP FI (Financial Accounting)
SAP FI - CA
SAP FI – FSCM
SAP FI - Travel Management
SAP FS (Insurance)
SAP GRC
SAP GTS
SAP HANA (In-Memory Appliance)
SAP HCM (SAP HR)
SAP HCM ESS/MSS
SAP HR-PA
SAP HR-PY
SAP hybris
SAP IS-U (Utilities)
SAP ITS
SAP LES
SAP LO
SAP Lumira
SAP MDM
SAP MDX
SAP MI
SAP MII
SAP MM
SAP MRO
SAP MRS
SAP Netweaver Applications Server
SAP Netweaver BW (BIW)
SAP NetWeaver Visual Composer
SAP NWDI
SAP NWDS
SAP Oil & Gas
SAP PI (NetWeaver Process Integ.)
SAP PLM
SAP PM
SAP PP
SAP PS
SAP PSCD
SAP Public Sector Management
SAP PY (Payroll)
SAP QM
SAP Retail
SAP Service & Asset Mgt.
SAP SCM
SAP SD
SAP SD – GTS
SAP Security
SAP SEM
SAP SM
SAP Smart Forms
SAP Solution Manager
SAP SRM
SAP TM
SAP Web Application Server
SAP WEBI
SAP WM
SAP WM – EWM
SAP Xcelsius
Siebel
Software AG webMethods
SuccessFactors
Web Dynapro
Workday HCM

Operating Systems

AIX
Apache Cloudstack
CoreOS
HP-UX
Linux
Mac OS X
Mobile operating systems(iOS, Android)
OpenStack
Red Hat Enterprise Linux
Solaris
Unix (all)
VMware vSphere
Windows 8/7
Windows NT
Windows Server 2008/2012

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494 Noncertified IT Skills Reported

(new this quarter in red)

Web/e-Commerce Development

Active Server Pages
ActiveX
Ajax
AngularJS
Apache Solr
Apache web server
Backbone.js
CGI
Cold Fusion MX
Content management systems
CSS/CSS3
Django
Docker
Documentum
Elasticsearch
Front End Development
Google Analytics
Google App Engine
Google Cloud Platform
HTML5
JavaBeans/EJB 3.0
JavaFX
JavaScript
Java Server Pages
JBoss Enterprise
Jetty
Joomla!
jQuery
JSON
KnockoutJS
Magento
Magnolia
Microsoft BizTalk Server
Microsoft Commerce Server
Microsoft Identity Integration Server
Internet Information Services
Microsoft Internet Security and Acceleration Server (ISA)
Microsoft Sharepoint
Microsoft Silverlight
Microsoft .NET
Mobile applications development
Mule/MuleESB
Node.js
Oracle Fusion
Oracle WebLogic
Oracle Workflow
Perl
PHP (all)
Python
React.js
Redux
REST
RESTful
Secure software development
Sitecore CMS
SOAP
Social Media/Networks
Spring Framework
TIBCO
UDDI
Umbraco
VBScript
Video/graphics editing
Visual Interdev
VoiceXML
Web collaboration appliances
WebSphere
WebSphere Datapower
Wikis
WSDL
XAML/XACML
XHTML MP
XML (all variants)

Management, Methodology and Process

Big Data Analytics
Business Analysis
Business intelligence Business process management/ modeling/improvement
Business performance management (software/systems)
Capacity Planning/Management
Change management
COBIT
Collaboration software
Complex Event Processing/Event Correlation
Configuration Management
Continuous Integration
CRM
Cryptography (encryption, VPN, Hybrids)
Cybersecurity
Data Analytics
Data Architecture
Data Governance
Data Integration
Data Management
Data Modelling
Data Quality
Data Science
Data Visualization
DevOps
E-Procurement
ERP
Game Development
Information management
IT Governance
ITIL V3
Kanban
Machine Learning
Marketo
Metadata design and development
Microservices
Microsoft SQL Server Analysis Services
Microsoft Visio
Network Architecture
Penetration testing
Predictive Analytics and Modeling
Prescriptive Analytics
Program Management
Project management/governance
QlikView
Quality management/TQM
Quantitative Analysis/Regression Analysis
Requirements Engineering/Analysis
Risk assessment/analysis
Risk management
Security architecture and models
SEO
Service Management
Social media analytics
Software development lifecycle management
Splunk
Tableau
Six Sigma/Lean Six Sigma
Test automation
Test Driven Development/Scripting
TIBCO ActiveMatrix BusinessWorks
TOGAF (Enterprise Architecture)
User Acceptance Testing
User Experience Design
Waterfall
Web Analytics
Webtrends analytics
Zachman Framework

Systems/Networks

Active Directory
Ansible
Apache Flume
Arista
ATM
Business continuity and disaster recovery planning
CA Endevor
Chef/Opscode
Cisco ASA
Cisco CUCM
Cisco ICM
Cisco ISE/Identity Services Engine
Cisco IPCC
CiscoNexus
Cisco UCCE
Cisco UCCX
Citrix XenApp
Citrix XenServer
Cloud architecture
Cloud security
DHCP
EIGRP
Ethernet
Fast Ethernet
Gigabit Ethernet(1 GigE/10 GigE)
HP Converged System
HP Quality Center
HTTPS
IaaS (Infrastructure as a Service)
Infrastructure architecture
Intrusion prevention/detection systems
IPX/SPX
Juniper
LAN
LTE
Microsoft Application Virtualization
Microsoft CVMM
Microsoft Hyper-V
Microsoft Virtual Server
Mobile device management
Mobile security
Multiprotocol Label Switching
Network access control/Identity mgt systems
NAS/Network Attached Storage
Network security management
Novell Netware
PaaS
Performance Analysis/Tuning
Performance Testing
Puppet
Rackspace Cloud
Routing (e.g. OSPF)
Salt
SAN/Storage Area Networks
Security skills (project-based)
SMTP
SNA
SolarWinds
Storage administration
TCP/IP
Tivoli
Vagrant
vCloud
Virtualization
Virtual security
VMware Server
VoIP/IP telephony
VPN/OpenVPN
WAN/3G/4G services
Web services security
WAP
Wireless Network Mgmnt
Wireline Networking/ Telecomm.
Wireless sensors/RFID
WML

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Database

Amazon DynamoDB
Apache Cassandra
Apache CouchDB
Apache Hive
Azure SQL Database
Amazon RedShift
Base SAS
Blockchain
Cloudera Impala
Couchbase Server
Database management
Data mining
Data security
DB2
dbase/xbase
ETL (Extract, transform, load)
Hbase
Informatica
Java Database Connectivity
Master data management
Microsoft Access
Microsoft Exchange Server
Microsoft SQL Server
MongoDB
MySQL
NoSQL
Oracle Application Server
Oracle Business Intelligence Enterprise Edition Plus
Oracle Coherence
Oracle DB 9i/10g/11i/12c
Oracle Exadata
Oracle Forms
Oracle Reports
Oracle Enterprise Manager
OpenEdge ABL (Progress 4GL)
PostgreSQL
Redis
Riak
Sqoop
Sybase Adaptive Server
TIBCO Spotfire
Visual SQL

Messaging & Communications

ActiveMQ
Apache Camel
Apache Kafka
Java Messaging Service
Lotus Notes/Domino
Message-oriented Middleware (Wave, XMPP/Jabber, etc.)
Microsoft Exchange
Novell Groupwise
Outlook/cc:mail/various clients
Oracle Comm Messaging Server
RabbitMQ
TIBCO Enterprise Message Service
TIBCO Rendezvous
Unified Communications/Messaging

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Q1 2017 Trend Charts

2017 IT Skills & Certifications Volatility Index™

(Data collected through April 1, 2017)

Demand dynamics in benchmarked certified and noncertified IT skills pay

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TRENDS 2016 IT Skills & Certifications Volatility Index™

Volatility in market value for individual IT skills and certifications---defined as incidence of gains or declines over a period of time in premium pay earned by IT professionals for specific technical and business skills---remained high from January 1 to April 1, 2017 according to the latest update of Foote Partners' long-running *IT Skills and Certifications Pay Index™* of market values for IT and business skills. Market value is measured by tracking additional cash compensation paid to workers by their employers for specific certified and noncertified skills they possess.

Current Quarterly Recap (data collected through April 1, 2017)

TOTAL: All Skills and Certifications

- **24.4%** of skills and certifications (218 of 893) changed in market value in 1st Quarter 2017 compared to **21.8**% in prior quarter
- **99** gained value (from 100 prior quarter), **119** declined in value (92)

CERTIFIED SKILLS

- **15.8%** of reported certifications (66 of 417) changed market value in 1st Quarter 2017, slightly higher than the **13.6%** volatility in the prior quarter and less than a one point lower than 12 and 24 month average volatility.
- **30** certifications gained market value (from 29 certs in prior quarter); **36** declined in value (27 certs)

NONCERTIFIED SKILLS

- **31.9%** of reported skills (152 of 476) changed value in 1st Quarter 2017, up from **29.1%** in the prior quarter and on par with both twelve month (31/2%) and two year (30.5%) average volatility.
- **69** gained in market value (from 71 prior quarter); **83** declined in value (65)

Tracking volatility is useful for both analyzing and forecasting demand for skills, for monitoring IT workforce transition, and for understanding IT management decision making. In fact we believe statistical volatility in IT skills pay offers a more complete story of true labor market conditions than salary movements and hiring behavior among other common indicators. Important in this distinction is that skills can be segmented and benchmarked more meaningfully than jobs.

Similar to jobs, IT skills have broad skills categories that can be tracked (e.g., security, networking, systems, database, applications development). But unlike jobs pay can be pinpointed to hundreds of niches: for example, SAN, virtualization, cloud, frameworks and processes, tools, and software modules. Also unlike most job trends analyses, within skills categories and niches are vendor-specific and vendor independent skill specializations for more granular tracking, analysis, and forecasting (e.g., SAP, Hadoop, Informatica, Ruby on Rails, Microsoft Sharepoint, collaboration appliances, Oracle database).

Since 2009 the strategic focus of many employers has emphasized *acquisition of skills* more so than the addition of full time jobs. In doing so employers have harvested skills from multiple labor channels: managed services, consultants, contractors, part timers, and only very selectively expanding the internal workforce with critical full time hires. **More reliance on the IT services industry has in fact added 289,600 additional IT service related jobs to payrolls in the past 24 months and 429,100 in the past 36 months according to the U.S. Department of Labor.**

Beyond the fact that it's usually more costly to hire full–timers (due to additional overhead of benefits, incentive plans, etc.), it can take months to find the right person with the necessary combination of skills and experience. And that works against the pressure on IT leaders right now to be more agile, react faster, and execute more quickly and predictably. This same pressure is also stimulating demand for cloud computing, advanced analytics, digital engagement, and host of software, platform, and infrastructure services.

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2017 IT Skills & Certifications Volatility Index™ Trends - cont'd.

Foote Partners sees market volatility in jobs and skill as the standard in market behavior for years to come. Business leaders know that it's not technology per se but the ability to use it wisely that counts. They desperately need to develop and cultivate a digitally-savvy workforce of hybrid business-technology workers with myriad skill combinations to suit their business strategies. Judging by both our skills demand survey data and the last several months of government jobs numbers, they're going to have to be patient.

Prime Directives for IT. Speed of execution is one tech leadership's key directives. Hiring FTEs is a tougher sell to senior management in a rapidly changing business landscape unless in addition to their immediate responsibilities, they are also viewed as highly flexible and adaptable multitalented individuals who can offer value in other as yet defined ways as the business transforms.

The business environment is increasingly global and brutally competitive; speed to market with the right product or service is critical. It may take several tries to get it right, which is why labor force agility is key. With businesses making rapid directional changes to react to market conditions, they cannot afford to waste money hiring works whose skills sets may have a very short shelf life.

Perhaps the prime direction for anyone leading IT resources is that how to transform a workforce that has operated for years in heavily siloed, hierarchical organizational models. The end game right now is how to achieve greater agility, reaction time, and speed of execution with an acceptable cost and headcount while simultaneously operating and innovating the business.

VOLATILITY HIGHLIGHTS - 10 Year Trending

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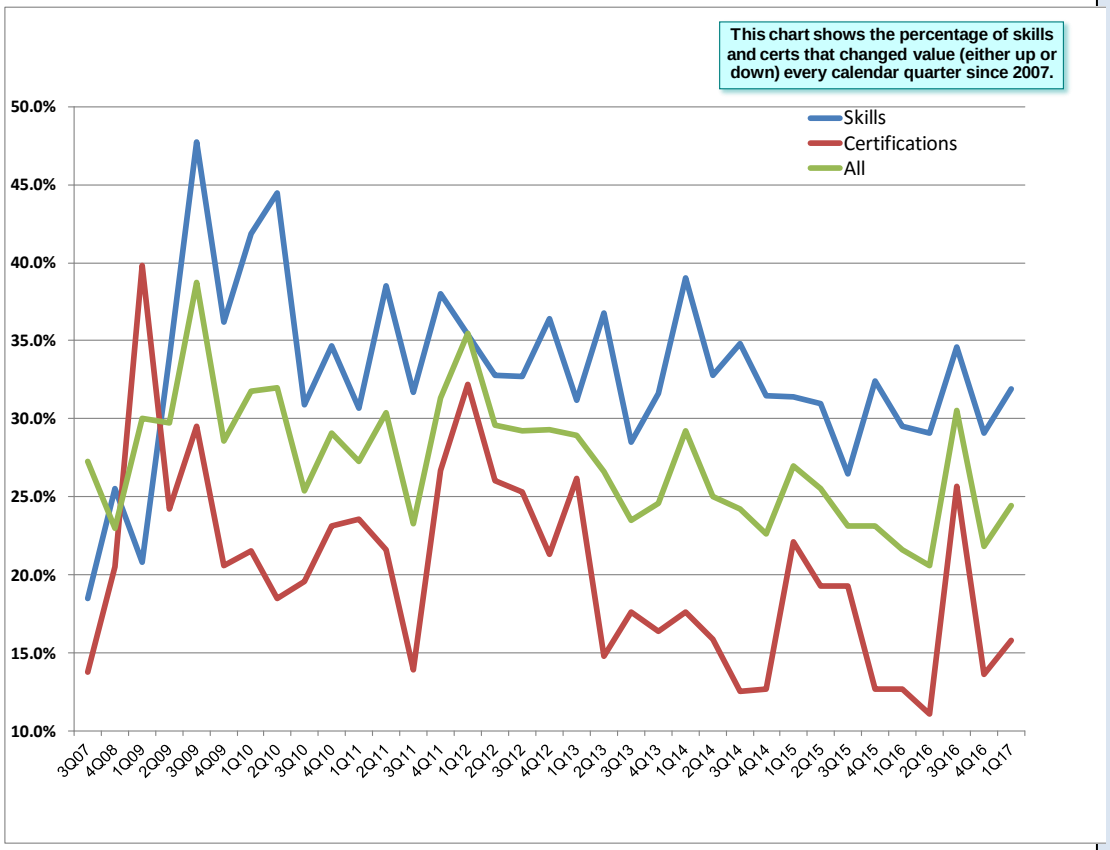
Foote Partners, LLC
Foote Research Group

Foote Partners News Release – June 10, 2017

IT Skills and Certifications Volatility Index™ – 916 Skills and Certifications



(Source: Foote Partners LLC, 2017 IT Skills & Certifications Pay Index™)

Recent IT skills and certifications volatility trends

QUARTERLY SUMMARY

1st Quarter 2017 volatility in skills and certifications values measured 24.4%, nearly 3 point greater than the 21.8% volatility in the prior quarter

FINDING: This quarter's overall volatility for all 893 skills and certifications is identical to the 12 month average of 24.3% and slightly higher than the two year average, 23.8%.

NONCERTIFIED SKILLS VOLATILITY increased to nearly 32% from 29.1% in the previous quarter.
FINDING: Q1volatility is on par with the 31.2% average for the past 12 months.

IT CERTIFICATIONS VOLATILITY rose in Q1 2017, more than two point higher than the prior quarter but substantially lower than the 25.7% volatility in 3Q 2016
FINDING: This quarter's volatility is lower than the 16.6% twelve-month running average.

(Pay data supporting these charts available in the *IT Skills and Certifications Pay Index™* – 2007 to 2016 quarterly data edition)

VOLATILITY HIGHLIGHTS – IT Certifications (1Q 2017 data)

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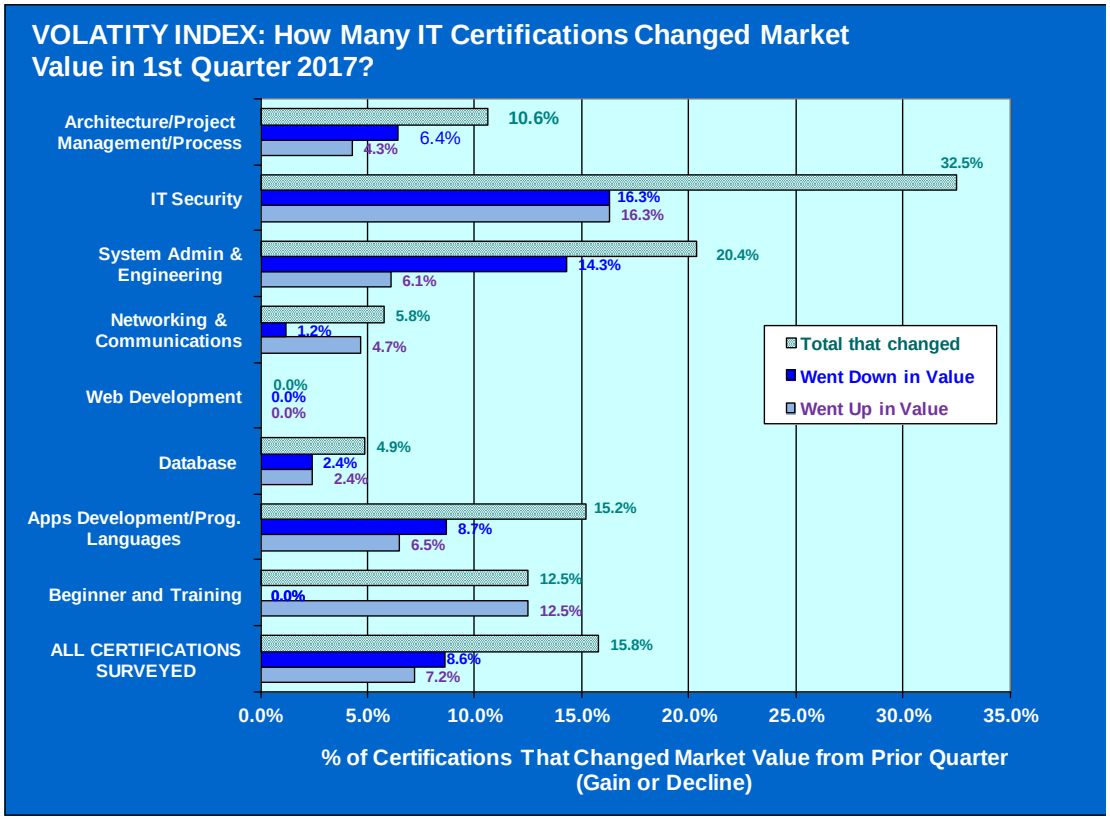

(Pay data supporting these charts available in the *IT Skills and Certifications Pay Index™* – 1st 2017 Quarter data edition

IT Skills and Certifications Volatility Index™
1Q 2017 data edition findings: IT Certifications

Among 417 certifications surveyed, highest volatility (≥20%) occurred in these segments (ranked highest to lowest):

- IT Security
- Systems Administration & Engineering

Within segments, notable upward volatility (value **gains**) occurred most in these (ranked):

- IT Security

Within segments, notable downward volatility (value **declines**) occurred most in these (ranked):

- IT Security
- Systems Administration & Engineering

(Source: Foote Partners LLC, 2017 IT Skills & Certifications Pay Index™)

VOLATILITY HIGHLIGHTS – Noncertified IT Skills (1Q 2017 data)

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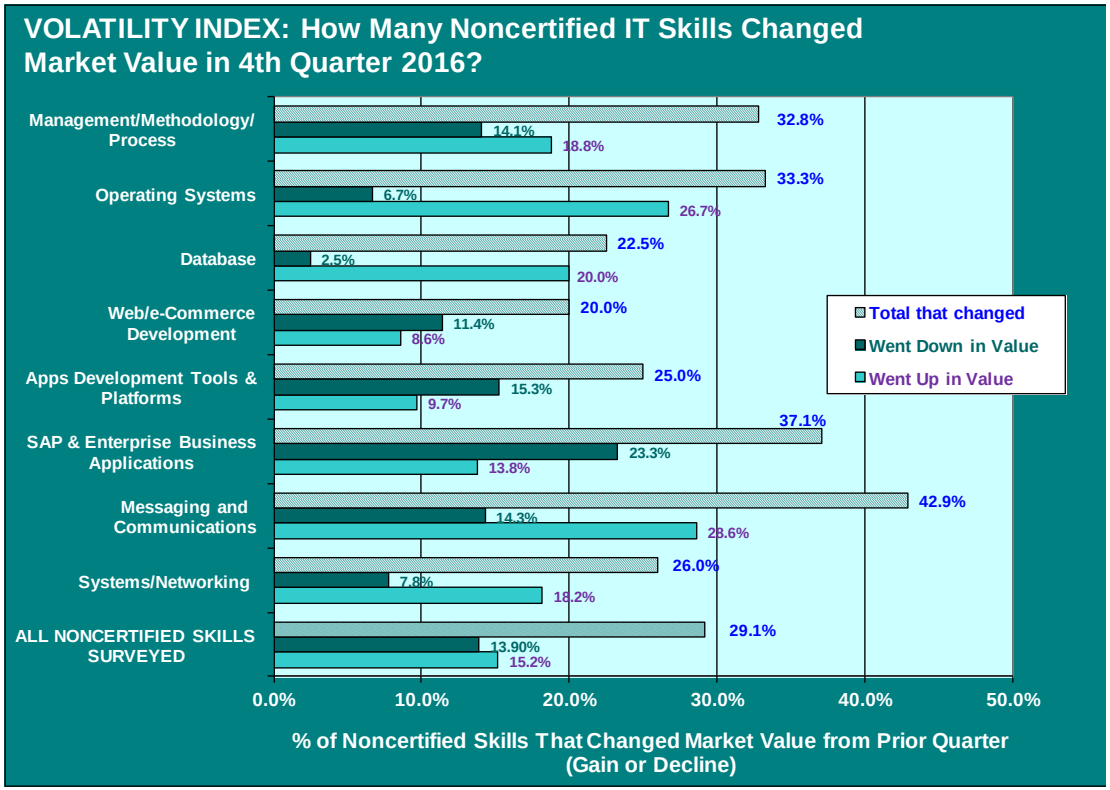

(Pay data supporting these charts available in the *IT Skills and Certifications Pay Index™* – 4th 2016 Quarter data edition

IT Skills and Certifications Volatility Index™
1Q 2017 data findings: Noncertified IT Skills

Among 417 certifications surveyed, highest volatility (≥20%) occurred in these segments (ranked highest to lowest):

- IT Security
- Systems Administration & Engineering

Within segments, notable upward volatility (value **gains**) occurred most in these (ranked):

- IT Security

Within segments, notable downward volatility (value **declines**) occurred most in these (ranked):

- IT Security
- Systems Administration & Engineering

(Source: Foote Partners LLC, 2017 IT Skills & Certifications Pay Index™)

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IT Skills and Certifications Pay Index™ – 1st Quarter 2017 data edition

- Pay premiums for **916 certified and noncertified IT skills**
  - Three data points for each position: 10th, 50th, 90th percentile
- Verified and validated IT skills pay data from **72,120 IT professionals at 3,038 employers** in US and Canada
- Current data collected through April 1, 2017 (updated quarterly)
- Certifications Guide containing basic information about surveyed IT certifications (pre-requisites; costs; test content; lab requirements, etc.)

Pricing: $5,400 single edition. $18,335 annual subscription.

Definition of IT skills premium pay

- Pay that IT workers receive for possessing high-value IT and business skills used on the job
- Given in the form of a bonus, or embedded in base salary to adjust for the presence of a dominant vendor or technology central to job performance (examples: Cisco Network Engineer, Python Software Engineer, Redhat Linux Systems Administrator, or SAP Developer.)
- Often used to adjust either base pay or total pay in situations where job title does not match actual on-the-job duties and responsibilities, and changing the job title is not an attractive option
- May be used as a reward, recruiting inducement, retention tool, or as a guide for creating consulting rate cards

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ABOUT THIS RESEARCH

Foote Partners' primary research survey for tracking IT skills and certifications pay and supply/demand volatility is the industry-leading ***IT Skills and Certifications Pay Index™*** **(ITSCPI),** launched in 1999 and updated every three months since that time. Data covering 262,640 IT professionals at 3,038 employers in 83 U.S. and Canada cities are reported for IT salaries and skills pay earned for 212 positions and 916 certified and noncertified technical and business skills. Verified and validated pay data for 72,120 IT workers has been included in the 1st Quarter 2017 edition of the ITSCPI, compiled from data collected through April 1, 2017.

Demographics of the participating organizations for our latest update are as follows, measured most appropriately for the type of business, by revenues, assets, total premiums and operating budgets:

- 18% of participating organizations have $5 billion+ in sales/$15+ billion in total assets
- 28% of participating organizations earn more than $1 billion in annual revenues or more than $5 billion in total assets
- 46% of participating organizations have $500+ million in sales/$1+ billion in total assets/$500+ million in premiums/$500+ million operating budget (government, educational, not-for-profit)
- 54% of participating organizations fall in the SMB (small-to-medium sized business) segment, generally defined as organization under $500 million in sales.
- [Public sector] 5% have operating budgets of $500 million or more, [nonprofit/educational sectors] 4% with operating budgets $100 million to less than $500 million

TO OBTAIN A COPY OF THE LATEST *IT SKILLS AND CERTIFICATIONS PAY INDEX™*

Please visit the Foote Partners web site: http://www.footepartners.com/itcompensation.html

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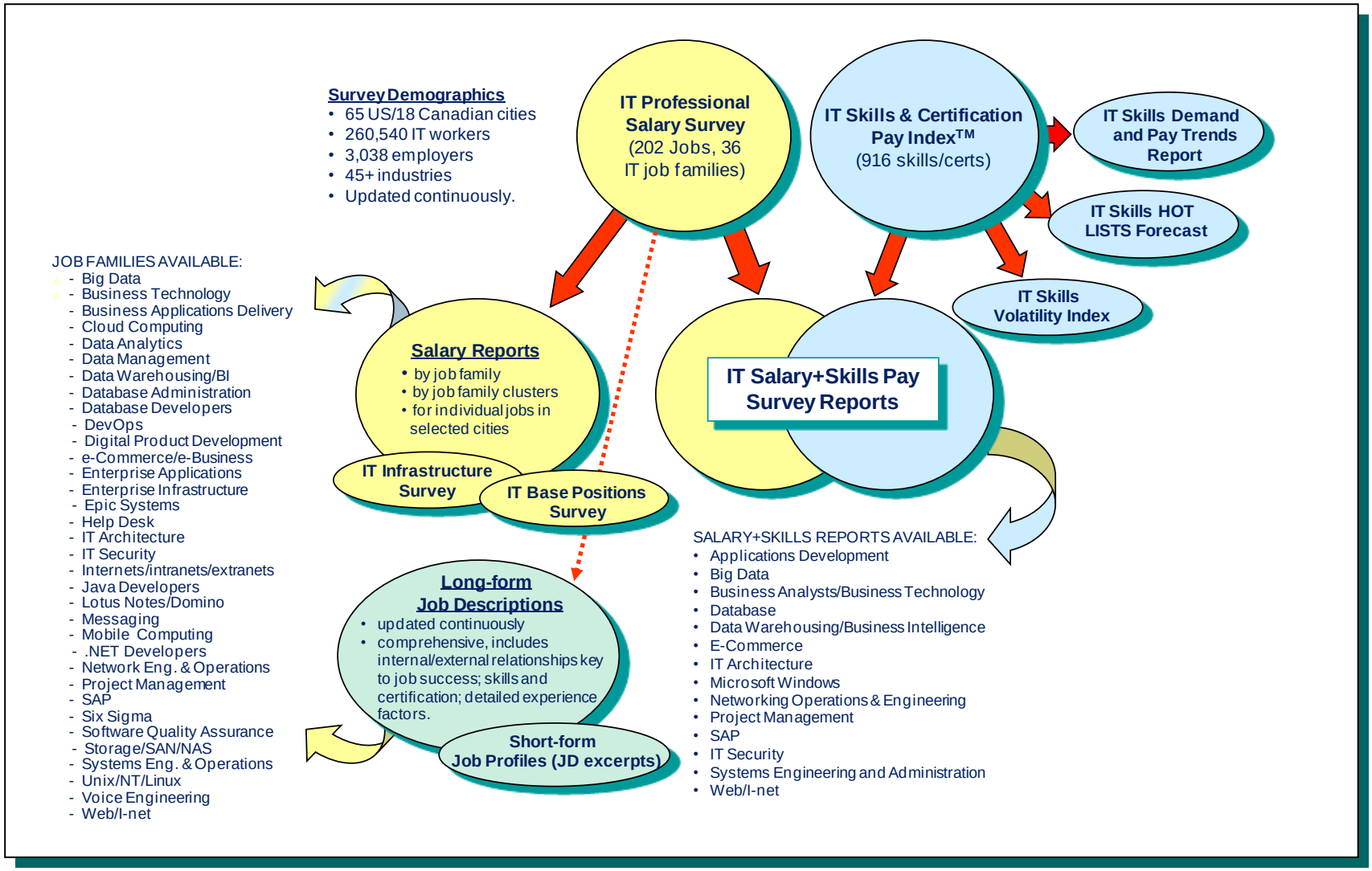
Foote Partners 2017 IT Compensation Survey Product Map



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ABOUT FOOTE PARTNERS

Foote Partners, LLC is an IT analyst firm and independent benchmark research organization focusing on the human capital and user (versus vendor) side of managing technology and IT value creation. A thought leader and trusted advisor to more than 4,600 employers on five continents who purchase our products and services, our company provides pragmatic forward -thinking advice and market intelligence targeting the human capital side of the modern highly integrated business/IT hybrid environment in which virtually all private and public organizations operate their businesses.

Our products are deeply grounded in specialized proprietary data-driven statistical and empirical research, surveys, and business intelligence collected from thousands of North American employers with whom we have deep longstanding research partnerships. These partnerships have been created and supported specifically to enable unique market intelligence views and difficult-to-find decision support research on the multiple facets of IT human capital management. As a group they were selected to meet strict criteria for what we believe is the most meaningful demographic representation for IT professionals for benchmarking purposes.

Founded in 1997 and comprised of former Gartner and META Group industry analysts, McKinsey & Company, Mercer and TowersWatson senior consultants, and former corporate HR, IT, and business executives, the firm's research division publishes 100+ quarterly-updated benchmarking, analytical research and forecasting products that help employers benchmark their IT compensation, solve difficult information technology management and workforce problems, and strengthen their ability to execute complex business solutions.

Foote Partners IT workforce and compensation survey findings and analyses are featured regularly in hundreds of HR, IT and business periodicals and media sources around the globe, including *Bloomberg BusinessWeek, Forbes, Fortune, Wall Street Journal*, *New York Times*, *CIO Magazine, ComputerWorld, Network World,* WorldatWork's *Journal* and *Workspan Magazine*; and in analyst appearances on network and cable television, National Public Radio, and countless podcasts and webcasts.

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