

Guide to the Information Technology Industry

OVERVIEW

According to the Computing Technology Industry Association ([CompTIA](#)), Information Technology (IT) is defined as the “utilization of computing via hardware, software, services, and infrastructure to create, store, exchange, and leverage information in its various forms to accomplish any number of objectives”.

[The Vault Guide to IT Jobs](#) has listed key elements of information technology that include:

Hardware: computers, servers, storage, tablets, mobile phones, printers, network equipment

Software: productivity and business applications, network and security applications, mobile apps, video games, cloud computing, virtual reality

Services: deployment, integration, custom development, repair/upgrade, managed services

Infrastructure: Internet backbone, telecommunications networks, cloud data centers

Information: data, documents, voice, video, images

Business Objectives: commerce, production, communication, collaboration

Job Summaries (from the Occupational Outlook Handbook)

According to the U.S Bureau of Labor Statistics, the employment of computer and information technology occupations will grow 12% from 2018 to 2028, which is much faster than the average for all occupations. These occupations are projected to add about 546,200 new jobs. IT professionals are likely to enjoy excellent job prospects, because many companies report difficulties finding these highly skilled workers.

Demand for these workers will stem from greater emphasis on cloud computing, the collection and storage of big data, and information security. The median annual wage for computer and information technology occupations was \$88,240 in May 2019, which was higher than the median annual wage. Some sample job summaries in the field include:

OCCUPATION	JOB SUMMARY
Computer and Information Research Scientists	Computer and information research scientists invent and design new approaches to computing technology and find innovative uses for existing technology.
Computer Network Architects	Computer network architects design and build data communication networks, including local area networks (LANs), wide area networks (WANs), and Intranets.
Computer Programmers	Computer programmers write and test code that allows computer applications and software programs to function properly.
Computer Support Specialists	Computer support specialists provide help and advice to computer users and organizations.
Computer Systems Analysts	Computer systems analysts study an organization’s current computer systems and find a solution that is more efficient and effective.



<u>Database Administrators</u>	Database administrators (DBAs) use specialized software to store and organize data.
<u>Information Security Analysts</u>	Information security analysts plan and carry out security measures to protect an organization's computer networks and systems.
<u>Network and Computer Systems Administrators</u>	Network and computer systems administrators are responsible for the day-to-day operation of computer networks.
<u>Software Developers</u>	Software developers create the applications or systems that run on a computer or another device.
<u>Web Developers</u>	Web developers design and create websites.

Career Trajectory

The career trajectory of IT professionals, depending on the type of company and industry, can range from specialization as a subject matter expert to a management track, which encompasses team management responsibilities.

Graduate students from the University of Chicago with a STEM focused degree typically enter the IT industry in a technical function such as software engineers, data scientists and full stack developers, and the job level will commensurate with the number of years of work experience and educational qualifications of the candidate.

These positions typically range from an entry level role with 0-3 years of work experience for a fresh advanced degree graduate, to a mid-level technical position including 3-8 years of prior work experience, and for candidates with 8-15 years of work experience including people management responsibilities, these candidates may be considered for middle level team leadership positions.

How do firms use graduate level skills?

According to [Higher Education Review](#), technical skills are preferred by employers because these candidates are considered to be better at multitasking. Technical skills do not only refer to developers who know programming, big data analysis or coding, it is also about knowing basic technologies like software, social media or using any online portals.

Much of the current enthusiasm for technology include not only software and programming tools, but also using open-source, cloud computing, and data visualization tools such as R, Python, SAS, STATA, Tableau, SQL, Orange and Hadoop (the most widely used framework for distributed file system processing).

For graduate students, many of these skills may already be in your professional toolkit. However, what is important is not only mastering specific tools like SQL but the investigative mindset and techniques that can be used with any tool. It is important not to get tool-minded but to get process-minded.



For example, let's say that a technical analyst job description stresses SQL Server Reporting Services skills and you only have knowledge of Microsoft Access at this point. What you can do is let the job interviewer know that you have:

- strong technical analysis skills and
- will be comfortable working on new technical tools

You can achieve this by:

- stressing your technical analysis experience by talking about your data validation experience,
- discussing how you have analyzed programming of datasets,
- drawn your own inferences and
- presented them successfully to management using a reporting tool.

Then you emphasize the strengths or advantages of your technical background and repeat that you are willing to learn the technical tools used by the employer in question (and bring it home, by illustrating how fast you geek out and pick up new tools as well in your learning process).

This is one way of showing transferable skills! You may also wish to point out other tools you have picked up on your own, such as by taking on MOOCs on Coursera, EdX, Udacity or Udemy, or additional qualifications on Codecademy or LeetCode, in order to demonstrate your interest and initiative.

What other experiences can graduate students bring to the table?

There are other key areas of transferability that you can bring to the world of technology. You can guide interviewers towards areas of work that you have covered academically and professionally - be it your coursework, project work, independent consulting work, and previous work experience.

For instance, have you:

- Utilized any coding and visualization tools through your coursework and project work that you can offer prospective interviewers a look into the way you think and create?
- Have you perhaps, through independent consulting work, covered a real-life problem involving a corporation, organization or institution, in which you helped to problem solve an issue that you can talk specifically about?
- How has your previous work and internship experience helped you overcome specific work challenges and how can these experiences be harnessed when you use them for behavioral based interviewing?

The graduate technical skills required depend on the career function and type that you have chosen, as well as the evolving nature of the job demand. The employers hunt for graduates who are well familiar with the essential technical skills according to the type of job they are offering.

To make your skills stand out, highlight them in your resume to grab the attention of the recruiters or employers, including a link to your GitHub and Kaggle repositories. You can also speak out about your technical skills during the interview, and perform them during the interviewing rounds involving technical interviews and assessment.



Companies

Many students are interested in the IT companies based on the West Coast including Silicon Valley, and according to [Crunchbase](#), a platform for finding business information about private and public companies, there are close to 10,000 IT companies there. However, IT companies are based anywhere within the world including within the United States. You can find work in a location of your choice relatively easily, as the IT industry embraces virtual and remote work arrangements more readily than many other conventional sectors.

In addition to tech giants such as Apple, Microsoft, and the highly recognizable brands of the FLAG companies (Facebook, LinkedIn, Amazon, Google), there are also many other small to medium sized companies and tech startups that are worthy of consideration to start a technology career.

Business Insider reports that the [31 best tech companies](#) to work for in 2020 according to employees, include:

1) Noom

What it does: Digital health and wellness programs

What employees say: "Noom is truly unique! I've been in the workforce for 35 years and this company truly cares about their employees & offers so much support and honesty." — Noom Virtual Health Coach (Phoenix, AZ)

2) Intuit

What it does: Personal finance software including TurboTax and QuickBooks

What employees say: "The culture is laid back, the cafe has amazing food, and you have the opportunity to make really good money helping small businesses achieve success!" — Intuit Senior Business Consultant (Fredericksburg, VA)

3) Slack

What it does: Workplace communication software

What employees say: "The leadership gets a lot of things right, the benefits are amazing, and work life balance is much better than a lot of other places I've been." — Slack Senior Software Engineer (Denver, CO)

4) AppFolio

What it does: Cloud-based software for business management

What employees say: "Great work-life balance, friendly management, fantastic training, dog-friendly, fun culture." — AppFolio Website Production Specialist (Santa Barbara, CA)

5) Nvidia

What it does: Graphics processor company that has recently expanded into autonomous vehicles and other AI-related industries

What employees say: "Amazing culture, great work-life-balance and a strong drive to succeed in every area makes NVIDIA one of the best places I've ever worked." — NVIDIA Senior Systems Software Engineer (Santa Clara, CA)



6) DocuSign

What it does: Maker of e-signature software

What employees say: "They treat their employees fairly, are dedicated to the success of their employees, have great work life balance, and very responsive management." — DocuSign Sales (Seattle, WA)

7) HubSpot

What it does: Marketing, sales, and service software provider

What employees say: "HubSpot culture is unlike any other I have experienced. Your coworkers are genuinely invested in your success and will extend themselves to ensure you have access to the resources you need." — HubSpot Inbound Success Coach (Cambridge, MA)

According to [Eric Bloom](#), a former CIO, and current Executive Director of the IT Management and Leadership Institute, there are definite advantages and challenges of working at large versus small companies.

Big Companies	Advantages	Potential Challenges
	Good way to learn about best practices: IT hardware, software, process and methodology standards tend to be better defined	Specialized: assigned to a specific type of technology, application or responsibility so it may be difficult to gain a wide range of experience and skills.
	Network: More employees, therefore more chances to widen technical contacts.	Politics: often criticized for having highly active office politics and may be problematic.
Small Companies	Scope & Advancement: More scope to cover with less employees, hence a greater potential opportunity to work on a wider variety of projects and technologies. If the small company goes through a dramatic growth, there is the chance to grow professionally with it.	Standards: Software standards in small companies tend to be less formally defined. As a result, it is more difficult to learn industry best practices and formal industry standard methodologies.
	Culture: often have more of a "family" feeling than larger companies. As a result, they can be a great place to work.	Limited promotion: less opportunity for promotion because there are less internal open positions to apply for and less internal movement in general.

At the end of the day, both large and small companies can be great places to work and very advantageous for your career. What it comes down to is the:

- Type of company where you feel most comfortable working
- Job market and professional opportunities in your preferred location
- Personal and professional contacts that can assist you in finding employment
- Type of company that can best take advantage of your technical skills

In Forbes list of [The Best Companies For Corporate Culture In 2019](#) which were derived from sentiment ratings provided by employees who anonymously rated their employers on Comparably.com, a big proportion of the [2019 award winners](#) were from the technology industry.

The winners were segmented into two ranked lists, top 50 Large companies (more than 500 employees) and Top 50 Small/Mid-Size companies (less than 500 employees).





















































Top 50 Large companies

COMPARABLY AWARDS


BEST COMPANY CULTURE
Top Rated by Employees

2019

LARGE COMPANIES	IN THE U.S.A.	
2	1	3
 Zoom Video Communications San Jose, CA	 Microsoft Redmond, WA	 ADP Roseland, NJ

4  Google Mountain View, CA	5  HubSpot Cambridge, MA	6  Insight Global Atlanta, GA
7  Smile Brands Irvine, CA	8  Costco Issaquah, WA	9  Qualtrics Provo, UT
10  T-Mobile Bellevue, WA	11  GitLab San Francisco, CA	12  LinkedIn Sunnyvale, CA
13  KeepTruckin San Francisco, CA	14  Workfront Lehi, UT	15  Sunrun San Francisco, CA
16  Southwest Airlines Dallas, TX	17  HEB San Antonio, TX	18  LogMeIn Boston, MA
19  Sage Atlanta, GA	20  Confluent Mountain View, CA	21  Trimble Sunnyvale, CA
22  BambooHR Lindon, UT	23  Vector Marketing Olaton, MO	24  TaskUs Santa Monica, CA
25  Northside Hospital Atlanta, GA	26  Ultimate Software Weston, FL	27  Stryker Kalamazoo, MI
28  Phenom People Ambler, PA	29  Globant San Francisco, CA	30  Centric Consulting Dayton, OH
31  Facebook Menlo Park, CA	32  Sport Clips Georgetown, TX	33  Emser Tile Los Angeles, CA
34  UiPath New York City, NY	35  BCD Travel Atlanta, GA	36  Deloitte (US) New York City, NY
37  Nordic Consulting Partners Madison, WI	38  Shipt Birmingham, AL	39  Smartsheet Bellevue, WA
40  Dynatrace Waltham, MA	41  Stanley Black & Decker New Britain, CT	42  Apple Cupertino, CA
43  Capital One McLean, VA	44  Chipotle Newport Beach, CA	45  Pipedrive New York City, NY
46  Coupa Software San Mateo, CA	47  GoDaddy Scottsdale, AZ	48  Wells Fargo San Francisco, CA
49  Starbucks Seattle, WA	50  Geico Cherry Chase, MD	

The 2019 Best Company Culture list is comprised of the Top 50 highest rated companies, based on anonymous feedback submitted by employees in the last 12 months directly on Comparably.com




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




























Top 50 Small/Mid-Size companies

COMPARABLY AWARDS


BEST COMPANY CULTURE
Top Rated by Employees

2019

SMALL & MID-SIZE COMPANIES	IN THE U.S.A.	
2	1	3
 Highspot Seattle, WA	 Weave HQ Lehi, UT	 Seismic San Diego, CA

4  SalesLoft Atlanta, GA	5  Greenhouse Software, Inc. New York City, NY	6  iQ New York City, NY
7  Upgrade San Francisco, CA	8  Automation Group Irvine, CA	9  CollabNet Alpharetta, GA
10  Culture Amp San Francisco, CA	11  Better Place Forests San Francisco, CA	12  Vokal Chicago, IL
13  RingDNA Sherman Oaks, CA	14  Drift Boston, MA	15  Malouf Logan, UT
16  Assurance Bellevue, WA	17  InnovateMR Culbassas, CA	18  InvestCloud West Hollywood, CA
19  Salsify Boston, MA	20  Periscope Data By Sisenca San Francisco, CA	21  TCG Miami, OH
22  Disruptive Advertising, Inc. Lindon, UT	23  Scoop Technologies San Francisco, CA	24  Overtime Brooklyn, NY
25  OJO Labs Austin, TX	26  Finity Salt Lake City, UT	27  Big Leap Lehi, UT
28  Central (formerly GamEffective) New York City, NY	29  Blend San Francisco, CA	30  AWAKE Santa Clara, CA
31  BlueConic Boston, MA	32  Next Caller New York City, NY	33  Eversight Palo Alto, CA
34  Veracity Engineering Washington, DC	35  Who What Wear Los Angeles, CA	36  KRT Marketing (acquired by Recruits) Lafayette, CA
37  Mixpanel San Francisco, CA	38  Sauce Labs San Francisco, CA	39  Lurn Rockville, MD
40  Branch Redwood City, CA	41  Snapdocs San Francisco, CA	42  Hawke Media Los Angeles, CA
43  GoSite San Diego, CA	44  Asana San Francisco, CA	45  Taxjar Woburn, MA
46  Alkami Technology Plano, TX	47  Ocular Therapeutix Bedford, MA	48  Globality Menlo Park, CA
49  Events.com La Jolla, CA	50  League Chicago, IL	

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The recruiting process

- **Timelines** – The larger IT companies typically recruit for advanced-degree candidates over the fall and winter quarters. Most firms use in-time hiring for advanced-degree holders, just as they do for experienced hires.
- **Interviews** - Most IT firms will have 3 rounds of interviews that involve some combination of conventional (behavioral or “fit”) interviews, technical interviews, and an element of technical testing to be completed.
- **Internships** – Most IT firms offer internships to graduates students/postdocs. The application process is similar to full-time recruiting, complete with technical interviews. Interns may be offered full-time positions based on their performance.

Salaries

In addition to [Glassdoor](https://www.glassdoor.com/), another valuable tool to help with your research on companies and salaries would be <https://www.levels.fyi/>, a Glassdoor equivalent for Silicon Valley.

Sample Alumni Profiles

[Anna Olson](#) – Software Engineer, Tegus | [Ana Beatriz Souza](#) – Program Manager, Microsoft

[Andrew Balmer](#) - iOS Developer, Bose Corporation

[Alex Sadvovskiy](#) - Vice President of Artificial Intelligence, SurePrep

[Ashley Wojdyla](#) - System Software Engineer, Discover Financial Services

[Edwin Fung](#) - Data Engineering Manager, Facebook

[George Oliver](#) - Software Engineer, CARMERA | [Lynn Yue](#) – Software Developer, Indeed.com

[Sangjin Lee](#) - Senior Director of Engineering, Paypal | [Sarah Koop](#) - Software Engineer at Braintree

Resources

CompTIA – <https://www.comptia.org/> | Job board – <https://www.indeed.com/>

International Association for Computer Information Systems - <https://www.iacis.org/>

IEEE Computer Society - <https://www.computer.org/> | ONetonline (IT career cluster) - <https://www.onetonline.org/find/career?c=11&g=Go>

Occupational Outlook Handbook of Computer and Information Technology Occupations - <https://www.bls.gov/ooh/computer-and-information-technology/home.htm>

Startups in Chicago – <https://www.builtinchicago.org/> | Scrum Alliance <https://www.scrumalliance.org/>

UChicagoGRAD Data Science & Analytics Guide - <https://grad.uchicago.edu/wp-content/uploads/2019/11/Data-Analytics-Guide.pdf> | Vault IT & Engineering Guides - <https://access.vault.com/vault-guides/it-engineering>

