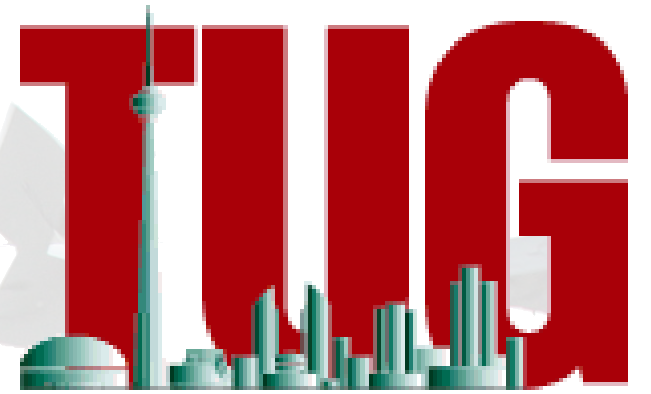


Failure to Modernize... The Real Cost



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 J_Buck51

A Perfect Storm?

By Jim Buck

December 2008

A "Perfect Storm" is IBM's term for the poor condition of Information Technology's (IT) current college enrollment. This fall brings my seventh year teaching IBM i classes at Gateway Technical College and was marked with the college mailing "Voluntary" layoff letters to the entire Information Technology faculty. This was due to steadily declining student enrollment in all of the IT programs since 2002.

As president of the WMCPA (www.wmcpa.org), I interact with many IT professionals both in Wisconsin and Illinois. Often asked how classes are going, I always answer "Great... except for the lack of students." The person asking the question inevitably replies something akin to "What? I figured your classes would be full!" Many times, potential employers ask if I have any outstanding recent graduates



College IT Enrollment Trends

Gateway Technical College is a member of the Wisconsin Technical College System (WTCS); which includes 16 colleges and 47 campuses. Many graduates of this system continue their education and complete four year degrees. The table below displays the Information Technology enrollment and graduation figures for all WTCS colleges. Enrollment in IT programs has decreased 57% in the last 5 years with graduation at only 27% of the rate in 2002.

Wisconsin Technical College System							
	2002	2003	2004	2005	2006	2007	%
Enrollment	9165	7635	6309	5160	4048	3915	42.72%
Graduation	1089	1088	995	816	640	289	26.54%

Agenda


- Employment Trends
- IT Future Growth
- I.T. Retirements
- College Today
- Skills Gap
- Students Today
- How To Fail
- What You Can Do



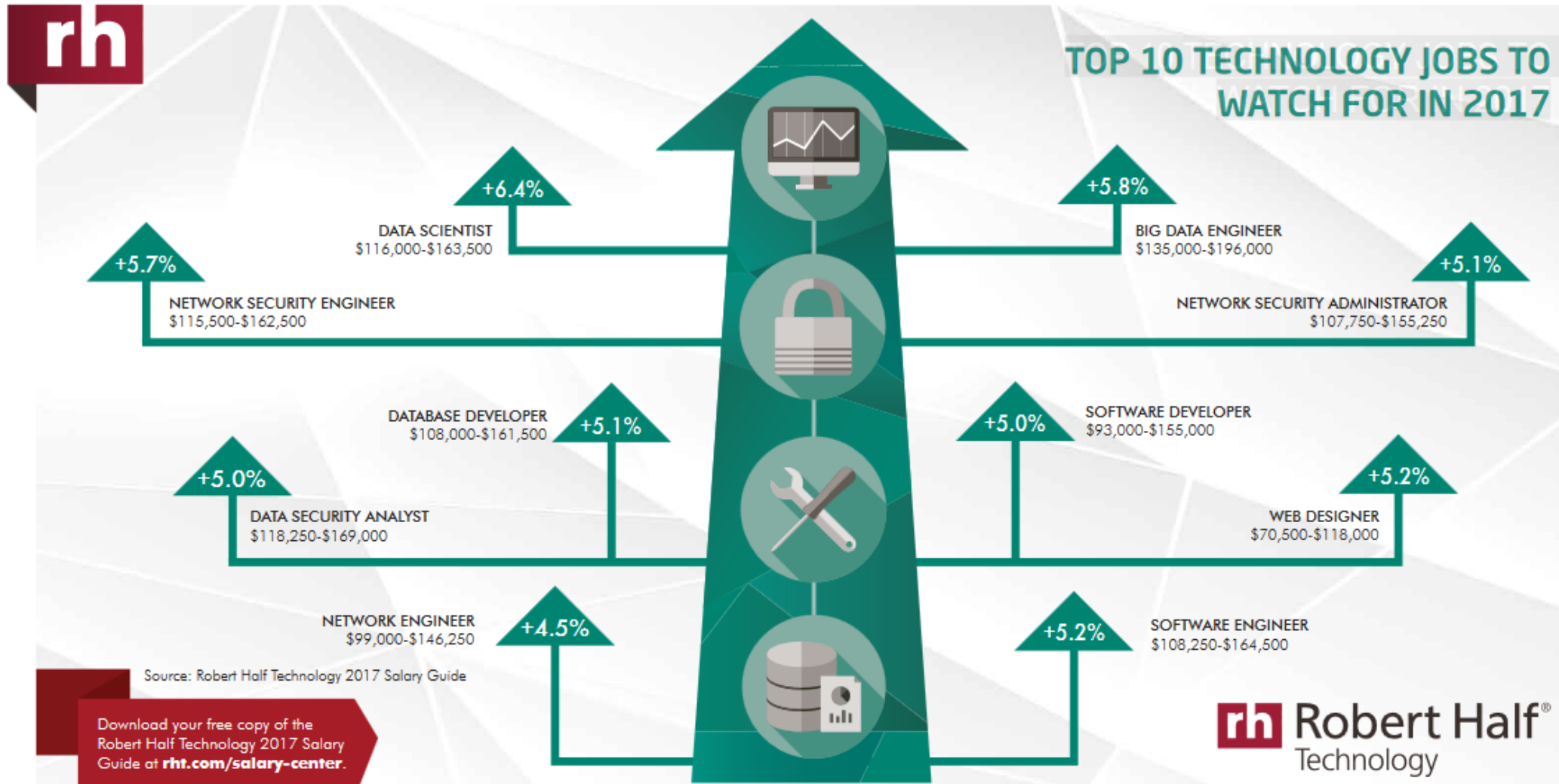
Failure To Modernize Employment Trends



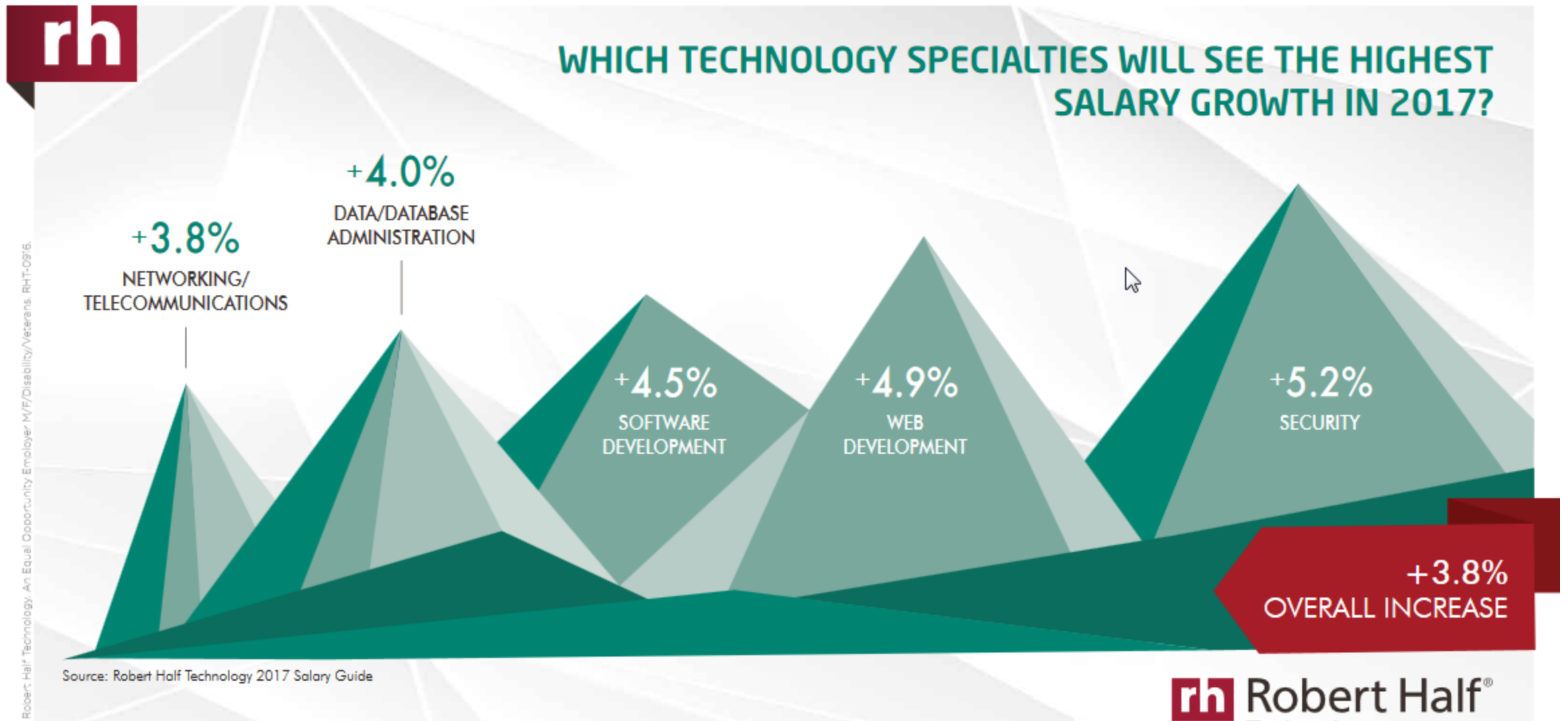
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TOP 10 TECHNOLOGY JOBS TO WATCH FOR IN 2017



TECHNOLOGY SPECIALTIES HIGHEST SALARY GROWTH IN 2017?



4 TRENDS AFFECTING HIRING AND PAY FOR TECHNOLOGY JOBS



4 TRENDS AFFECTING HIRING AND PAY FOR TECHNOLOGY JOBS

1. Timing is everything

Top candidates often receive multiple offers, so organizations need to move quickly. When faced with a lengthy hiring process, 39% of candidates lose interest and pursue other roles.



2. Skilled talent is in short supply

The unemployment rates for specialized positions are typically lower than the national rate. These professionals are difficult to hire given the high demand and short supply.



3. Education is essential

Employers consider college a must for most professional roles. More than 95% of jobs created during the recovery have gone to those with some college education.

4. Temporary is becoming permanent

Rather than let a job sit vacant, firms are bringing in temporary professionals. This gives them more time to recruit or determine if the temporary worker is the right fit for a full-time role.

Sources:

1. Robert Half survey of more than 1,000 working professionals
2. U.S. Department of Labor's Bureau of Labor Statistics
3. "America's Divided Recovery: College Have and Have-Nots," Georgetown University Center on Education and the Workforce

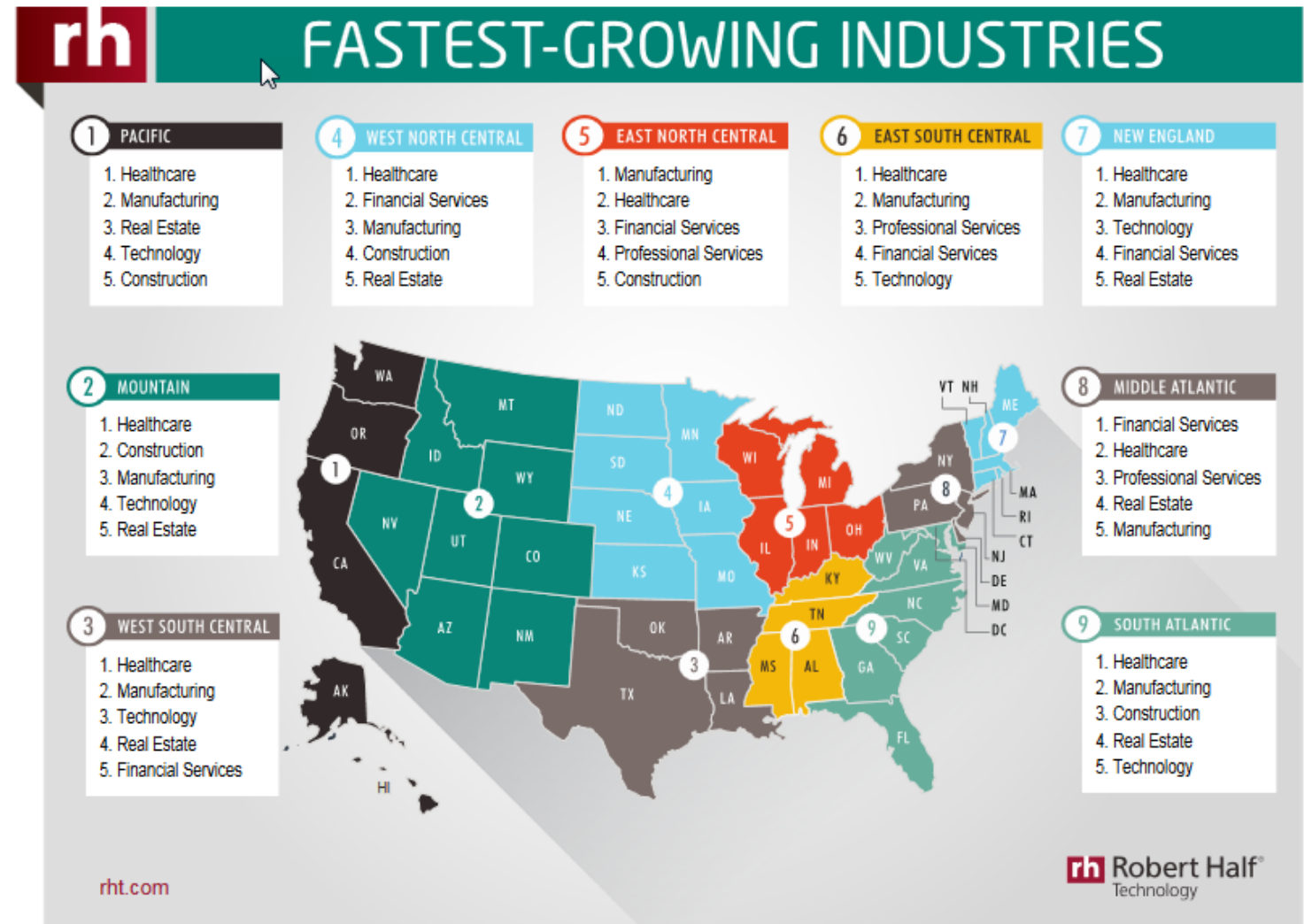
Download your free copy of the Robert Half Technology 2017 Salary Guide at rht.com/salary-center.



FASTEST GROWING INDUSTRIES

Top National Growth Industries are heavy users of Information Technology

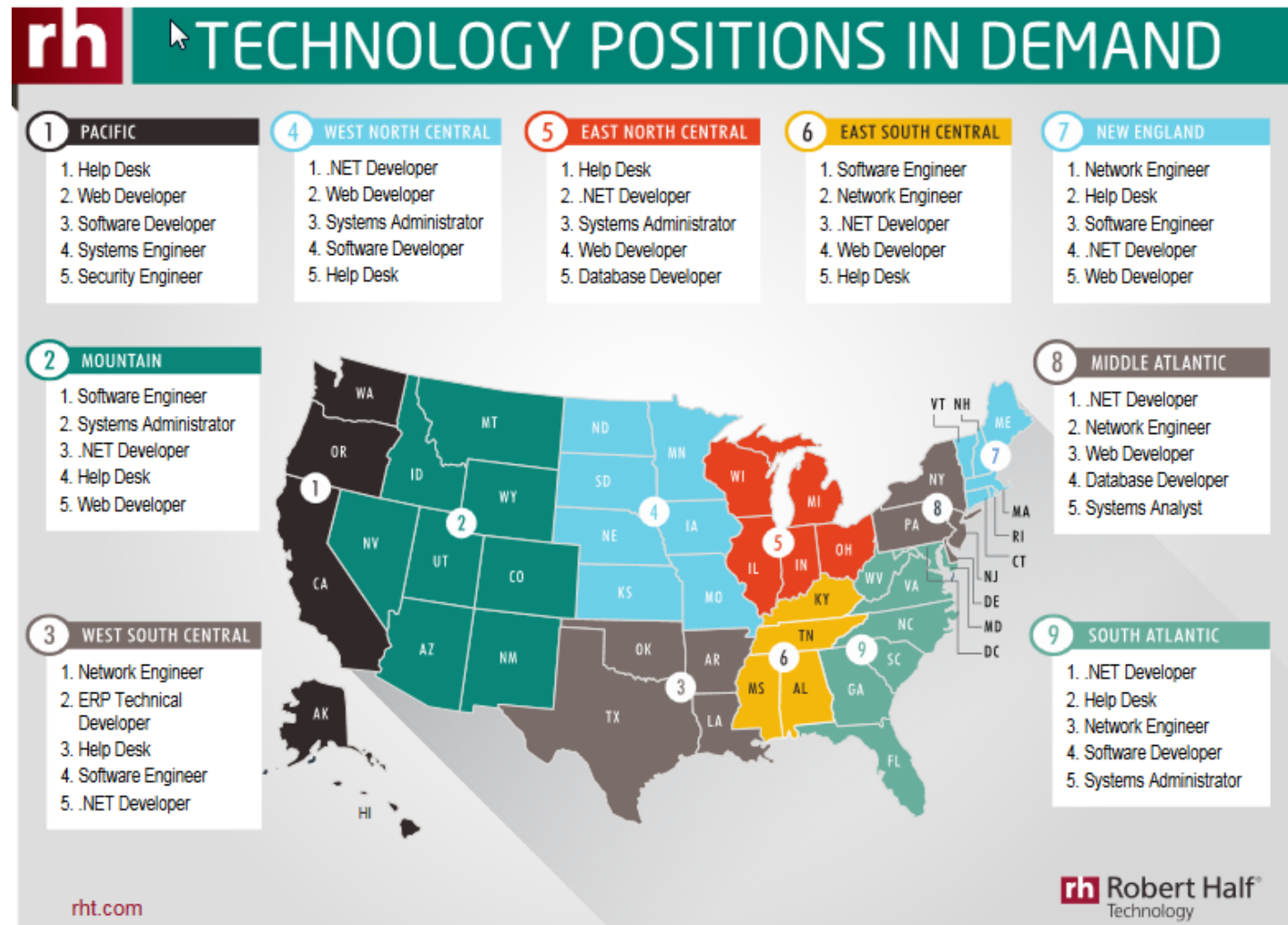
- #1 Healthcare
- #2 Manufacturing
- #3 Technology
- #4 Financial Services



TECHNOLOGY POSITIONS IN DEMAND

Top IT Positions

- Developers (web, software and mobile applications)
- Business intelligence analysts
- Database administrators
- Help desk and desktop support professionals
- Systems engineers and systems administrators



NATIONAL SALARY RANGES

APPLICATIONS DEVELOPMENT (A)	2016	2017	
Manager	\$ 105,750 - \$ 160,500	\$ 107,750 - \$ 167,250	3.3%
Project Manager	\$ 95,250 - \$ 146,500	\$ 97,250 - \$ 151,750	3.0%
Systems Analyst	\$ 81,750 - \$ 121,000	\$ 84,500 - \$ 125,000	3.3%
Applications Architect	\$ 121,250 - \$ 171,750	\$ 124,500 - \$ 178,750	3.5%
Business Systems Analyst	\$ 84,000 - \$ 122,000	\$ 86,250 - \$ 127,000	3.5%
CRM Business Analyst	\$ 87,500 - \$ 126,000	\$ 89,500 - \$ 132,250	3.9%
CRM Technical Developer	\$ 98,500 - \$ 137,750	\$ 100,000 - \$ 146,000	4.1%
Developer/Programmer Analyst	\$ 80,000 - \$ 137,000	\$ 83,000 - \$ 143,250	4.3%
ERP Business Analyst	\$ 92,500 - \$ 132,000	\$ 95,000 - \$ 137,750	3.7%
ERP Technical/Functional Analyst	\$ 98,000 - \$ 140,750	\$ 100,000 - \$ 146,250	3.1%
ERP Technical Developer	\$ 100,750 - \$ 148,500	\$ 102,750 - \$ 154,250	3.1%
Lead Applications Developer	\$ 110,750 - \$ 160,750	\$ 115,000 - \$ 167,000	3.9%
Mobile Applications Developer	\$ 115,250 - \$ 175,750	\$ 118,750 - \$ 182,250	3.4%
Technical Writer	\$ 55,500 - \$ 87,250	\$ 56,500 - \$ 89,250	2.1%

Add the percentage below, based on national averages, to IT salaries for the following skills:

- AJAX (Asynchronous JavaScript and XML) development skills 5%
- Business Objects skills 5%
- C# development skills 7%
- C++ development skills 4%
- Hyperion skills 5%
- Java development skills 8%
- Java EE/J2EE development skills 8%
- LAMP (Linux, Apache, MySQL and Perl/PHP/Python) skills 7%
- .NET development skills 7%
- PHP development skills 7%
- SAP development skills 5%
- SharePoint skills 8%

Using labor market data to connect
and inform people, education, and business.

A photograph of two young women sitting on a stone ledge outdoors, looking towards the camera. The background shows trees and a building.

HIGHER

A photograph of a dark, cloudy sky with a faint silhouette of a person or structure in the foreground.

ECONOMIC

A photograph of a person wearing a blue protective suit and a white respirator mask, working in an industrial or laboratory setting.

WORKFORCE

A photograph of a woman and a man in a meeting room, looking at a laptop. A whiteboard and bookshelves are visible in the background.


ENTERPRISE

Breaking Down the Labor Market Supply & Demand Software Developers

WAGES & JOBS TRENDS

Occupation Summary for Software Developers, Applications 

792,329

Jobs (2016) 

+3.7%

 % Change (2016-2017)

\$47.68/hr

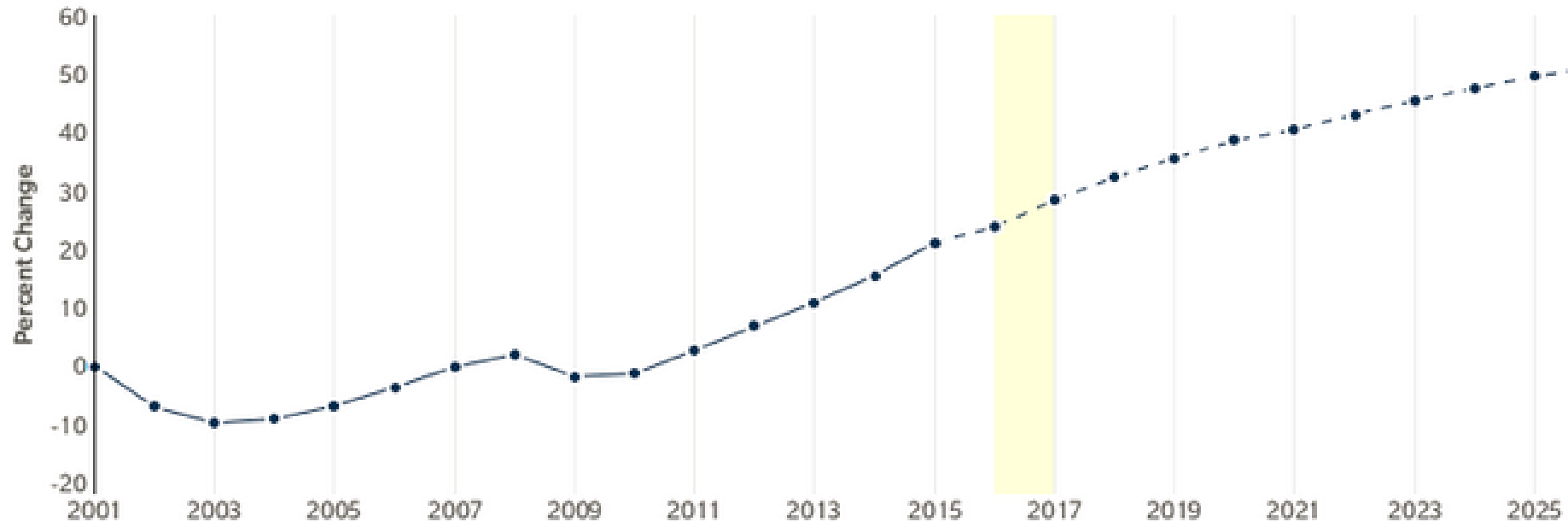
 Median Hourly Earnings 

Job totals for software developers have swelled to nearly 800k and show no sign of slowing over the next ten years. Median wages are strong at \$47.68/hr and leave plenty of room for growth with a 90th percentile wage of \$70/hr.

Breaking Down the Labor Market Supply & Demand Software Developers

Regional Trends

[Jump to Regional Comparison by Occupation](#)



Region	2016 Jobs	2017 Jobs	Change	% Change
● United States	792,329	821,693	29,364	3.7%

Breaking Down the Labor Market Supply & Demand Software Developers

In an average month:

- 115,058 unique job postings for Software Developers
- 33,579 actually hired.
- Approximately 1 hire for every 3 unique job postings.

JOB POSTING ANALYTICS

Job Postings Overview

[Jump to Job Posting Analytics](#)

1.61M

Unique Postings (Jan 2016 - Feb 2017) [?](#)
9.68M Total Postings

6:1

Posting Intensity (Jan 2016 - Feb 2017) [?](#)

Regional Average: 7:1

Job Postings vs. Hires

115,058

Avg. Monthly Postings (Jan 2016 - Feb 2017) [?](#)


33,579

Avg. Monthly Hires (Jan 2016 - Feb 2017) [?](#)

Failure To Modernize IT Future Growth?



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US Dept. of Labor - Bureau of Labor Statistics

- Information Security Analysts - 37%
 - Much faster than average
- Computer Systems Analysts - 25%
 - Much faster than average
- Software Developers - 22%
 - Much faster than average
- Database Administrators - 15%
 - Faster than average

The image displays six overlapping screenshots of the Bureau of Labor Statistics website, each showing the 'Summary' page for a different occupation. The occupations are Computer Programmers, Computer Systems Analysts, Information Security Analysts, Database Administrators, Web Developers, and Software Developers. Each screenshot displays key statistics such as 2012 Median Pay, Entry-Level Education, Work Experience, Number of Jobs in 2012, Job Outlook, and Employment Change from 2012-22.

Occupation	2012 Median Pay	Entry-Level Education	Work Experience in a Related Occupation	Number of Jobs, 2012	Job Outlook, 2012-22	Employment Change, 2012-22
Computer Programmers	\$74,280 per year \$35.71 per hour	Bachelor's degree	None	220,000	25% (Much faster than average)	127,700
Computer Systems Analysts	\$79,680 per year \$38.31 per hour	Bachelor's degree	None	520,600	25% (Much faster than average)	127,700
Information Security Analysts	\$86,170 per year \$41.43 per hour	Bachelor's degree	None	118,700	15% (Faster than average)	17,900
Database Administrators	\$77,080 per year \$37.06 per hour	Bachelor's degree	Less than 5 years	118,700	15% (Faster than average)	17,900
Web Developers	\$62,500 per year \$30.05 per hour	Associate's degree	None	1,018,000	22% (Much faster than average)	222,600
Software Developers	\$93,350 per year \$44.88 per hour	Bachelor's degree	None	1,018,000	22% (Much faster than average)	222,600

I.T. Services Growing

- IT Employment expected to grow
- Average annual rate of 6.1%



The screenshot shows the Bureau of Labor Statistics website. At the top, there is a red navigation bar with the text "UNITED STATES DEPARTMENT OF LABOR" and "BUREAU OF LABOR STATISTICS". Below this is a search bar and various menu items. The main content area features the article title "Careers in the growing field of information technology services" by Lauren Csorny. The article text discusses the growth of the IT services industry and its impact on employment. To the right of the article is an image of a man in a suit holding a laptop, with various icons floating around it. Below the image is a "Download PDF Version" link. At the bottom right, there is a "RELATED ARTICLES" section with links to other publications.

UNITED STATES DEPARTMENT OF LABOR
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BEYOND THE NUMBERS
HOME | BROWSE ARCHIVE | ABOUT | SEARCH

April 2013 | Vol. 2 / No. 9
EMPLOYMENT & UNEMPLOYMENT

Careers in the growing field of information technology services

By Lauren Csorny

Computers and information technology (IT) touch nearly every aspect of modern life. Information technology can help with such diverse tasks as driving motor vehicles and diagnosing diseases. IT enables seamless integration and communication between businesses anywhere in the world. To keep IT systems running, a large workforce is needed to maintain networks, create new software, and ensure information security. In addition, the proliferation of smart phones has given rise to a new "app economy," in which new employment opportunities are available for workers who create the programs that run on mobile devices.¹ Unlike many other sectors of the economy, employment in the computer systems design and related services industry (commonly known as IT services) was not significantly affected by the recession of 2007–2009. The industry lost about 1 percent of its employment in 2009 but regained momentum in 2010, when it surpassed the employment numbers from 2008.² The high demand for the services provided by this industry has created a large number of fast-growing and high-paying IT jobs.

What does the IT industry do?

Establishments in computer systems design and related services provide IT expertise for consumers and firms, often consulting with businesses to help them upgrade their computer systems, networks, or software.³ The industry is the largest of any computer-related industry, employing more than 1.5 million people in 2011.

Computer systems design and related services can be broken down into four subindustries: custom computer programming services, computer systems design services, computer facilities management services, and other computer related services. (See chart 1.) The first two are the largest, and account for almost 90 percent of all IT services employment. **Custom computer programming services** (NAICS 541511) includes establishments that write, test, and modify software for a particular client. This software includes computer programs, webpage design, and database design. Computer programming services also provide support to clients after the newly designed software is implemented.⁴

Download PDF Version

RELATED ARTICLES

- "Computer and Information Technology Occupations," *Occupational Outlook Handbook*.
- "Employment Trends and Training in Information Technology," *Occupational Outlook Quarterly*, Spring 2009.
- "After the Dot-Com Bubble: Silicon Valley High Tech Employment and Wages in 2001 and 2008."

2017 H-1B Visa Job Categories

Top 6 Jobs are IT Positions!

2017 H1B Visa Report: Top H1B Visa Occupation

1 - 50 | [51 - 100](#) | [101 - 150](#) | [151 - 200](#) | [search all](#)

Other Reports: [All](#) | [Occupation](#) | [Visa Status](#) | [Job Title](#) | [Industry](#) | [Work City](#) | [Work State](#)

Rank	Occupation	Number of LCA *	Average Salary
1	Software Developers, Applications	121,227	\$95,988
2	Computer Systems Analysts	98,750	\$81,394
3	Computer Programmers	81,814	\$69,478
4	Computer Occupations, All Other	53,875	\$80,892
5	Software Developers, Systems Software	21,851	\$111,170
6	Computer Systems Analyst	16,835	\$78,813
7	Management Analysts	15,009	\$92,937
8	Accountants And Auditors	11,204	\$67,426
9	Network And Computer Systems Administrators	11,152	\$76,233
10	Mechanical Engineers	9,616	\$80,632

2017 H-1B Visa Sponsors

2017 H1B Visa Reports: Top 100 H1B Visa Sponsors

Rank: [1 - 25](#) | [26 - 50](#) | [51 - 75](#) | [76-100](#) | [search all](#)


SubReports: [Visa Status](#) | [Job Title](#) | [Occupation](#) | [Industry](#) | [Work City](#) | [Work State](#)

Rank	H1B Visa Sponsor	Number of LCA *	Average Salary
1	Infosys	25,405	\$81,705
2	Capgemini	17,479	\$93,213
3	Tata Consultancy Services	13,134	\$76,099
4	IBM	12,381	\$87,378
5	Wipro	10,607	\$72,720
6	Accenture	9,479	\$81,585
7	Tech Mahindra (Americas)	8,615	\$75,879
8	Deloitte Consulting	7,645	\$122,667
9	Cognizant Technology Solutions	5,370	\$74,628
10	Microsoft	5,029	\$129,610
11	Hcl America	4,930	\$84,040
12	Google	4,897	\$129,997
13	Ernst & Young	4,625	\$98,722
14	Ust Global	3,170	\$69,819
15	Larsen & Toubro Infotech	3,092	\$76,755

Failure To Modernize I.T. Retirements



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 J_Buck51

Retirement Leads to IT Job Opportunities

- 10K people turn 65 every day
 - In the US
- Trend will continue through 2030



The screenshot shows the Wisecareers website interface. At the top left is the Wisecareers logo, which includes a stylized owl head icon and the text 'wiseCAREERS' in blue, with the tagline 'Career News, Tips, and Tricks' to its right. Below the logo is a navigation bar with links for 'HOME PAGE', 'TOP STORIES', 'BUSINESS', 'NURSING', 'EDUCATION', and 'INFORMATION TECHNOLOGY'. The article title 'Baby Boomer Retirement Makes Way For IT Job Opportunities' is prominently displayed in the center. Below the title is the date '17 September 2013 - 4:58pm'. The main text of the article discusses the retirement of baby boomers and the resulting job opportunities in IT. A photograph of an elderly couple smiling is positioned on the right side of the article.

wiseCAREERS Career News, Tips, and Tricks

HOME PAGE TOP STORIES BUSINESS NURSING EDUCATION INFORMATION TECHNOLOGY

Home » Information Technology »

Baby Boomer Retirement Makes Way For IT Job Opportunities

17 September 2013 - 4:58pm

Baby boomers are retiring at a rapid rate, and this could mean more job opportunities for anyone pursuing a career in information technology. Approximately 10,000 people in the United States turn 65 every year, and that trend will continue through 2030. According to a study from Georgetown University, this means that [31 million jobs will open up](#) as baby boomers retire.

This is excellent news for anyone who has been struggling to find work since the U.S. economic downturn. In the case of IT, veteran workers are still relied upon to [help run critical systems](#) on somewhat dated technology, according to CIO. However, many have been relegated to part-time or consultancy positions, which opens up opportunities for those who are new to the IT field.

As baby boomers move toward retirement, many companies are opting to have them help transition new IT professionals into their roles by providing training on how to use and maintain older technologies.




Retirees Help Create 55 Million Jobs

- Baby boomers retiring
- 31M jobs will open up
- 24M more by 2020

GEORGETOWN UNIVERSITY GIVING CONNECT DIRECTORY Q

BABY BOOMER RETIREES WILL HELP CREATE 55 MILLION JOBS BY 2020




A new Georgetown study finds that once the nation's baby boomers retire, 31 million jobs will open by 2020, and 65 percent of those job vacancies will require some postsecondary education and training.

June 28, 2013 – A Georgetown report released this week predicts that 31 million jobs will open up as baby boomers retire, and another 24 million new jobs will be available by 2020, barring any unforeseen economic or political surprises.

The report by Georgetown's Center on Education and the Workforce (CEW) also predicts a shortfall of five million workers with postsecondary education and training.

"If the U.S. Congress can deal with budgetary challenges, we are on schedule for recovery," says center director Anthony P. Carnevale. "But we will still face a major shortage of college-educated workers, especially as baby boomers retire."

FASTEST GROWING JOBS



Four out of five of the fastest growing occupations – health care professionals and technical, STEM, education and community services – will require high levels (80 percent) of people with postsecondary educations. Information technology and government jobs

IT Starts to Prepare for a Workforce Exodus

- IT veteran workers
 - Still relied upon
 - Help run critical systems
 - On somewhat dated technology




[www.cio.com/article/2383118/careers-staffing/
with-worker-retirements-looming--it-starts-to-prepare-for-a-workforce-exodus.html](http://www.cio.com/article/2383118/careers-staffing/with-worker-retirements-looming--it-starts-to-prepare-for-a-workforce-exodus.html)

Failure To Modernize Colleges Today



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 J_Buck51

Colleges Have Changed

- BIG business now!
- It's the bottom line
- It's "Butts in the seat!"
- Receive funding based on enrollment & grants
- Constantly trying to maximize revenues



An Instructor Teaches What Sells...

- Instructors paid by the number of students



An Instructor Teaches What Sells...

- Instructors paid by the number of students
- A low number of students
 - Class is cancelled
 - Instructor receives a lower percentage of his workload



An Instructor Teaches What Sells...

- Instructors paid by the number of students
- A low number of students
 - Class is cancelled
 - Instructor receives a lower percentage of his workload
- Instructors teach many classes...
 - They have to make a living!



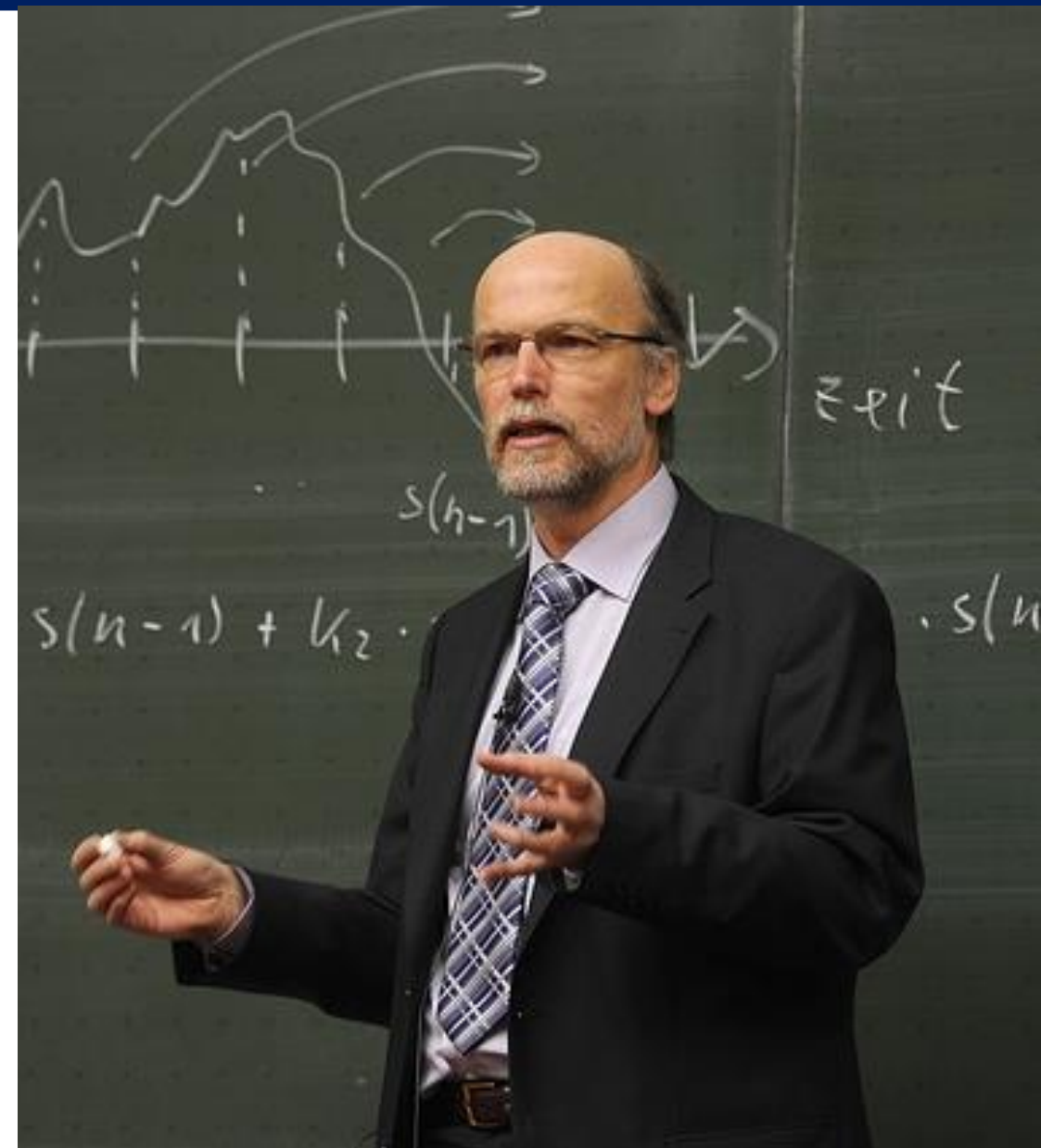
An Instructor Teaches What Sells...

- College instructors in “Highly skilled” areas
 - Compensated at a much lower rate than their counterparts in industry
- No compensation difference between teaching
 - Microsoft Office and PC Basics
 - IBM i System Administration
- Teach Large number of classes
 - Limited time to learn new technologies



What Instructors Do

- Teach what is easy & fun!
- What will entertain my students?
- Teach topics that
 - Are easy to learn
 - Have unlimited resources for the instructor & student
- Popular technologies lead to more students



College performance

Question – If college's are doing a great job... why do we need 1.2 million H1B's?


Today's businesses have limited input on what colleges teach.



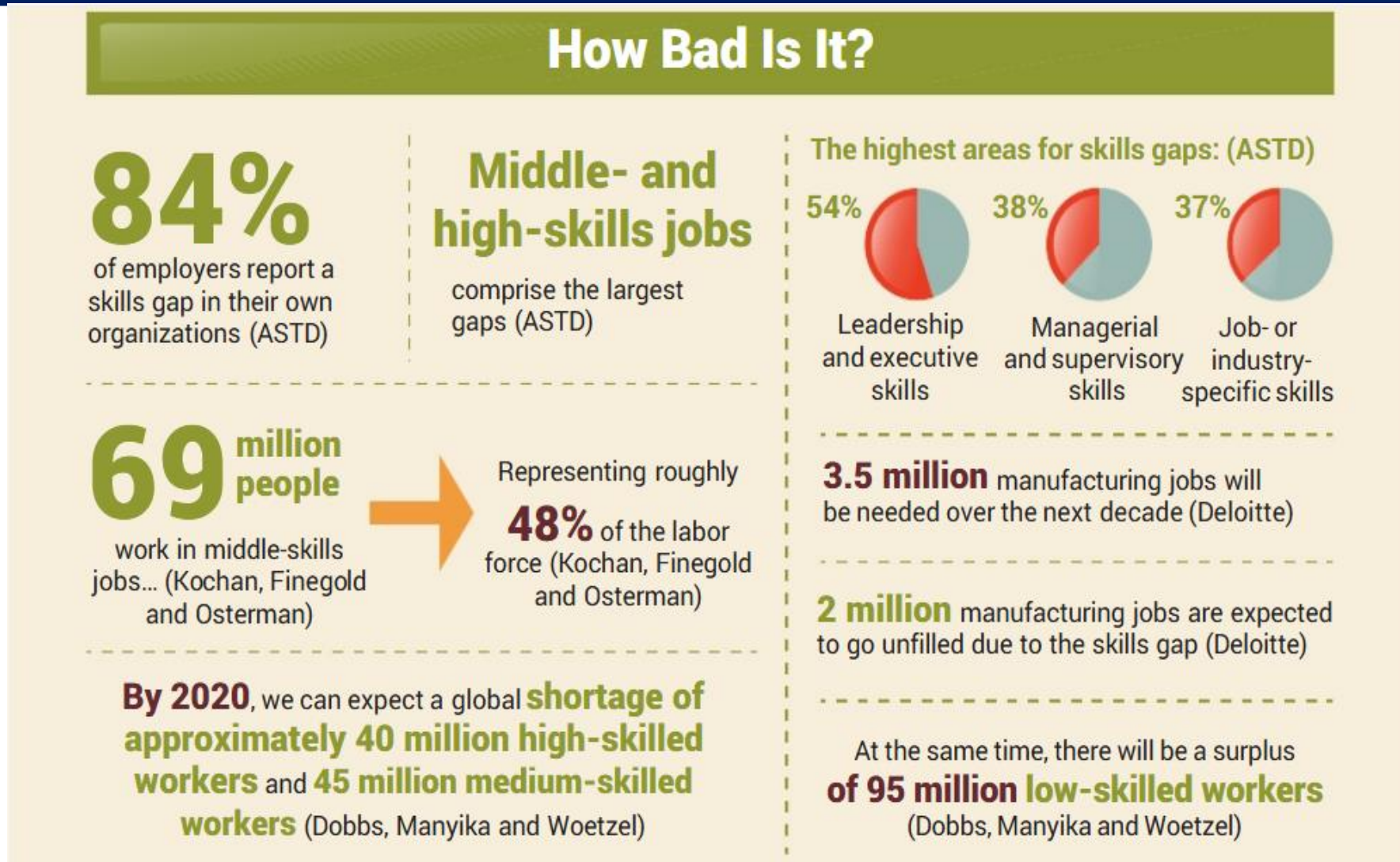
Failure To Modernize Skills Gap



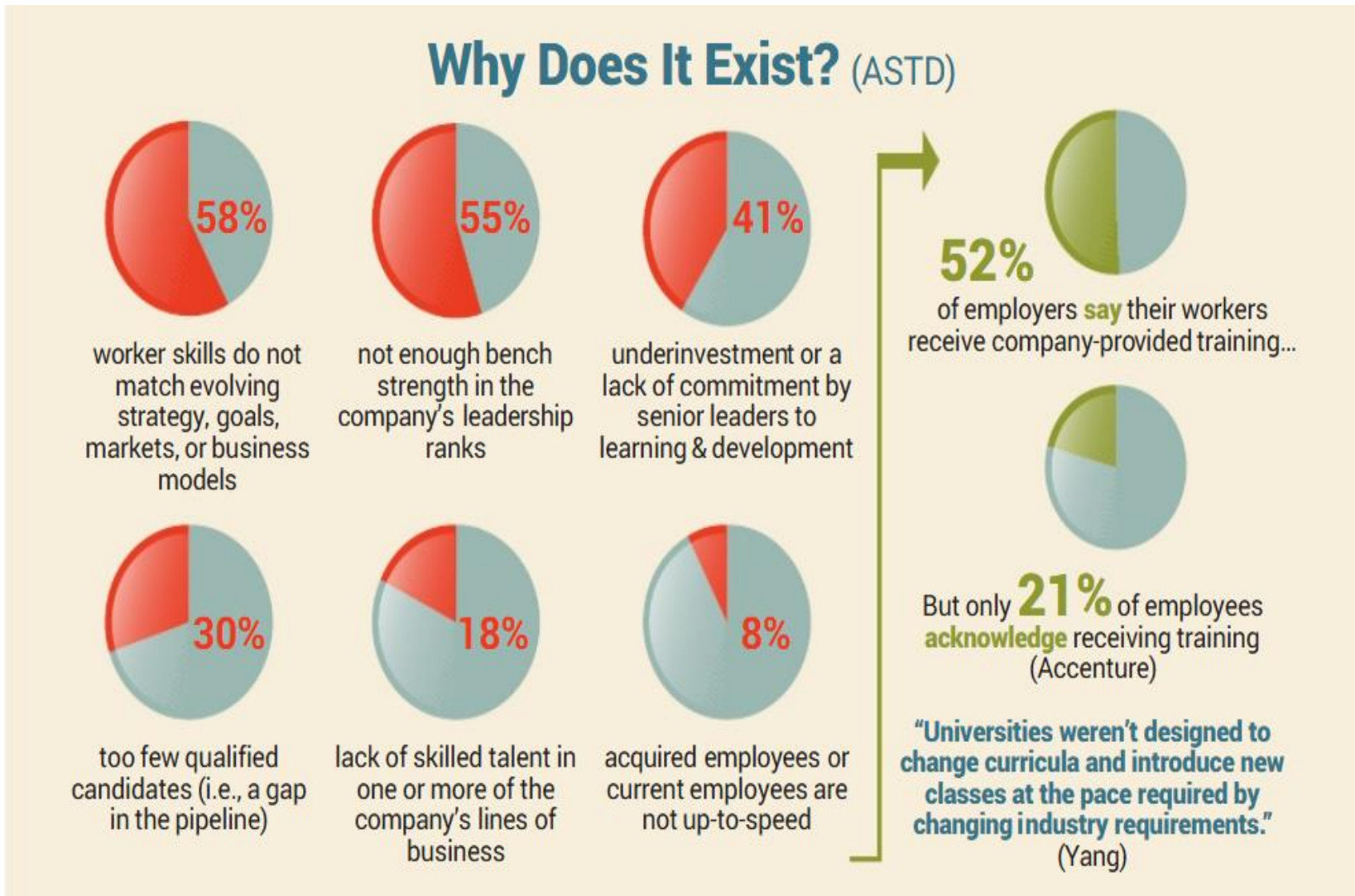
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The Skills Gap... it's a growing problem



The Skills Gap... it's a growing problem



The Skills Gap... it's a growing problem

What Are the Consequences?



39% of U.S. employers reported difficulty filling jobs due to lack of available talent (Bessen)



75% of manufacturers report a moderate-to-severe shortage of skilled resources...



Resulting in an 11% **decline** in EBITDA (Accenture)

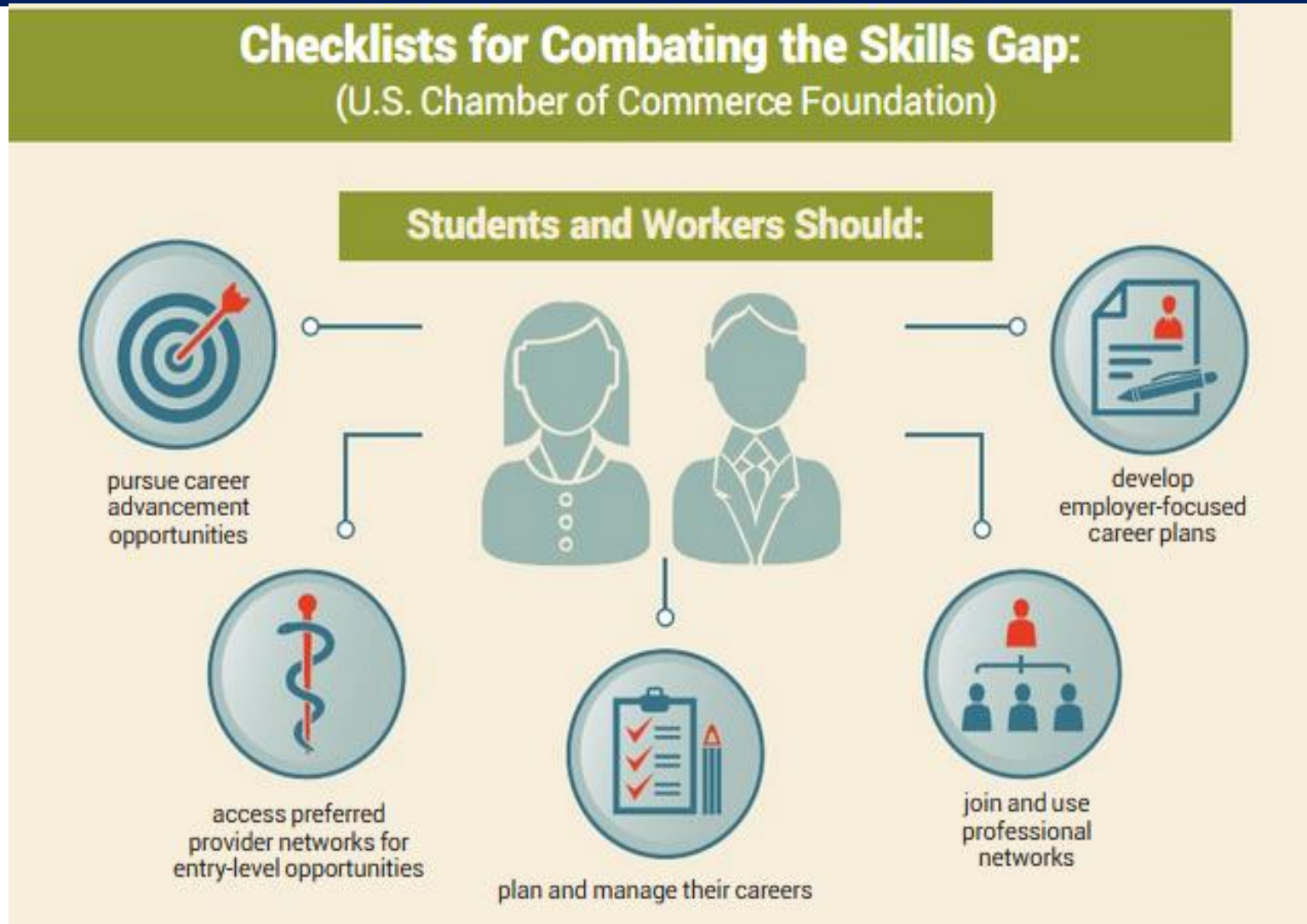


Two-thirds of employers anticipate a loss of business to competitors, due to **shortages in IT skills, engineering skills, R&D skills, and sales skills** (Accenture)

46% of U.S. Executives at large firms are concerned they won't have the skills they need in the next one to two years (Accenture)

9% We can expect a 9% decline in the standard of living by 2030 unless we address labor market challenges (Benitez)

The Skills Gap... it's a growing problem



The Skills Gap... it's a growing problem



The Skills Gap... What about Canada???

The screenshot shows the Robert Half website interface. At the top, there is a dark red header with the Robert Half logo on the left, and navigation options for 'Canada', 'EN', 'FR', and a phone number '1.888.597.2170' on the right. Below the header is a dark grey navigation bar with links for 'JOB SEEKERS', 'EMPLOYERS', 'WORKPLACE RESEARCH', 'SALARY CENTRES', 'ABOUT US', 'BLOG', 'MEDIA', and 'LOCATIONS'. A light blue breadcrumb trail reads 'Home / Workplace Research / Demand for Skilled Talent'. The main content area features a large heading 'Demand for Skilled Talent' and a preview of a report cover. The report cover includes the Robert Half logo, the title 'SPECIAL REPORT: THE DEMAND FOR SKILLED TALENT', and the subtitle 'Volume 13 - Q1/Q2 2017'. It also contains several statistics: '56% CFOs report challenges in finding skilled professionals', '55% of employees feel their employer's ability to help develop their leadership skills is "weak"', and '21% of companies have done anything to integrate millennial employees into the workplace and only 40% have a mentorship program'. A 'Workplace Research' dropdown menu is open on the right, showing 'Demand for Skilled Talent' as the selected item. Below it is a 'Search Jobs' section with input fields for 'Keywords', 'City or Region', and a 'Select a Specialization' dropdown.

rh Robert Half®

Canada EN | FR

1.888.597.2170

JOB SEEKERS EMPLOYERS WORKPLACE RESEARCH SALARY CENTRES ABOUT US BLOG MEDIA LOCATIONS

Home / Workplace Research / Demand for Skilled Talent

Demand for Skilled Talent

rh SPECIAL REPORT: THE DEMAND FOR SKILLED TALENT
Volume 13 - Q1/Q2 2017

THE HIRING ENVIRONMENT: CONTINUED RECRUITING CHALLENGES EXPECTED IN 2017

Employers, especially smaller businesses with fewer resources, find it increasingly challenging to attract and hire highly skilled professionals. Candidates have the upper hand in the current job market, and competition for their services can make the recruiting process more complex.

Successful employers understand the need to move quickly when hiring, often without skipping important steps. They offer competitive compensation and perks to attract professionals with the skills most in demand. These businesses also focus on creating a satisfying work environment that fosters productivity and engagement, and values employee retention.

This report is a collection of the latest research, including data from Statistics Canada, and is designed to shed light on the hiring environment and talent shortage. It also emphasizes why hiring managers need to move quickly in their recruiting efforts.

EMPLOYERS ADDING JOBS, BUT NOT ALL COMPANIES HIRE FOR SUCCESS

In 2016, employment gains totalled 214,000 or 1.2%, the fastest December-to-December growth since 2012. In comparison, employment grew by 0.9% in 2015.*

50% of CFOs said they typically post an open job and wait for resumes, instead of actively recruiting.*

47% of CFOs said that aside from poor performance, failed hires are a result of a mismatched skill set.*

77% of Canadian millennials feel their employer's ability to help develop their leadership skills is "weak."*

Only 10% of companies have done anything to integrate millennial employees into the workplace and only 40% have a mentorship program.*

rh Robert Half®

Workplace Research

Demand for Skilled Talent

Search Jobs

Keywords

City or Region

Select a Specialization

https://www.roberthalf.ca/sites/roberthalf.ca/files/rh-pdfs/rh_demand_skilled_talent_vol13_can.pdf

The Skills Gap... What about Canada???

EMPLOYERS ADDING JOBS, BUT NOT ALL COMPANIES HIRE FOR SUCCESS



In 2016, employment gains totalled 214,000 or 1.2%, the fastest December-to-December growth since 2012. In comparison, employment grew by 0.9% in 2015.⁴



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47% of CFOs said that aside from poor performance, failed hires are a result of a mismatched skill set.⁶



77% of Canadian millennials feel their employer's ability to help develop their leadership skills is "weak."⁷



Only 10% of companies have done anything to integrate millennial employees into the workplace and only 40% have a mentorship program.⁸

The Skills Gap... What about Canada???



64% of workers said they would consider a job offer from a recruiter regardless of whether they had been considering a career move.⁹



65% of Canadian workers are prepared to leave their employer. The top reason for changing companies is more salary, benefits and perks (66%).¹⁰



Average starting salaries for Canadian professional occupations are expected to increase 3.1% in 2017.¹¹



69% of employees said flexible hours is the family-friendly perk that would most affect their decision to join a company.¹²



44% of millennials anticipate changing jobs in the next 12 months.¹³

A motivated and engaged workforce is also a happy and productive one. Robert Half surveyed more than 12,000 workers in Canada and the United States and found that on a scales of 0-100, respondents scored a 71. The happiest workers are ...

- **Proud of their company** – Having pride in one's organization is the No. 1 driver of workplace happiness.
- **A good match** – Workers who report that they are a poor fit with their employers are the most apt to leave.
- **Small business employees** – People working in firms with fewer than 10 employees have the highest workplace happiness levels.
- **Experienced professionals** – Employees ages 55 and up report the highest levels of happiness on the job.

Source: Who Are the Happiest Workers and What Are the Top Drivers of Workplace Happiness? Robert Half and Happiness Works, Oct. 27, 2016.

The Skills Gap... it's a growing problem

Employers are having difficult time filling jobs

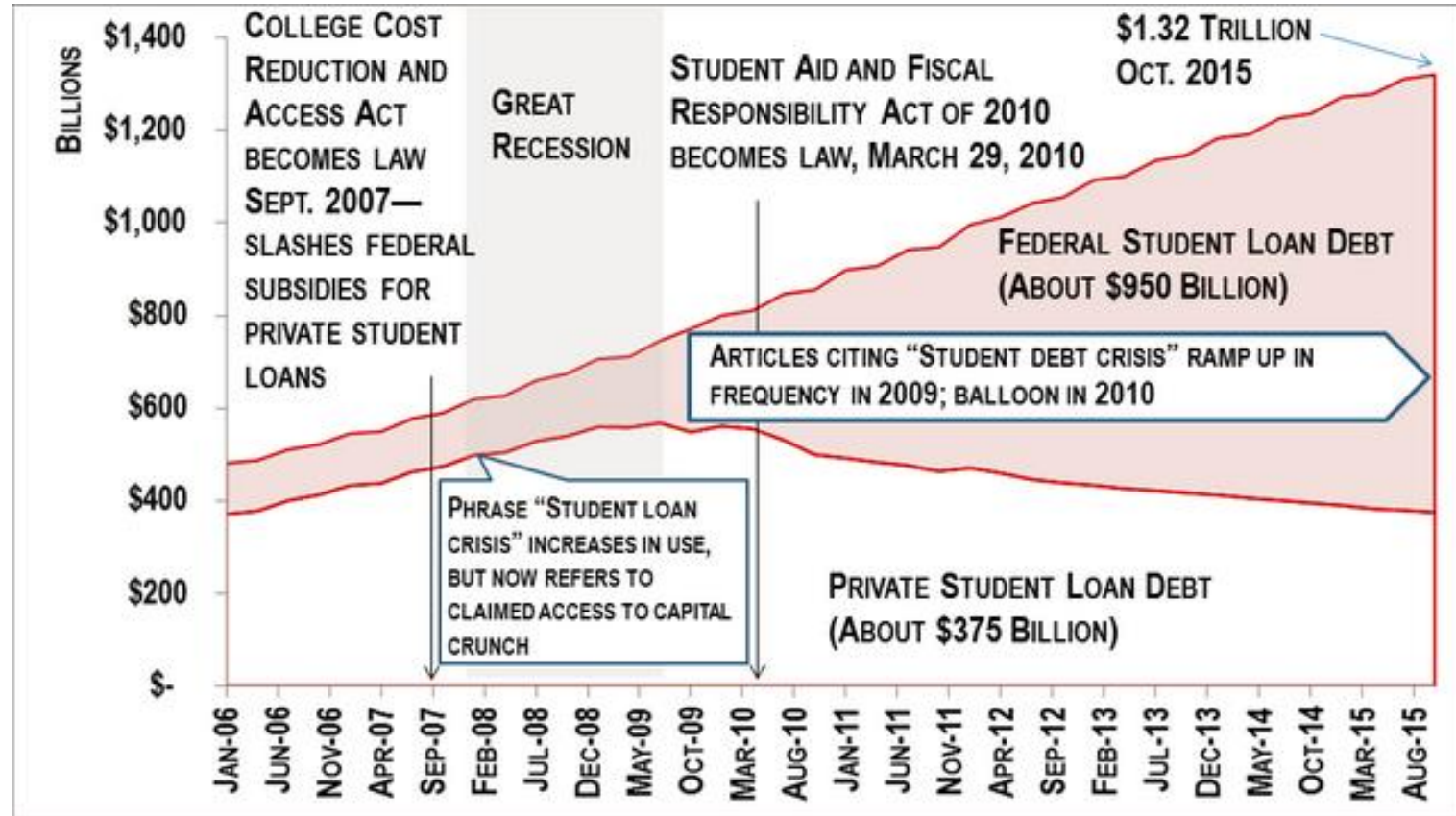
- Interesting fact when more people are graduating with college degrees than ever before;
- 39% of people under 25 unemployed or underemployed
- 64% of today's jobs don't require a college education



The Skills Gap... it's a growing problem

Student Debt:

- Totals 1.3 Trillion
- This amounts to 2/3 of total Credit Card and Auto Loans
- 15 percent of retirees have student loan debt



[Student Debt Crisis: The Recession Started It; Colleges Sustain It; And Politicians Make It Worse](#) - Forbes

The Skills Gap... How about Canada???



Since 1999

STUDENT FINANCE 101

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useful? spread the word!

How Big is Canada's Student Debt Today?

The Canada Student Loan Debt Clock

The Canadian Federation of Students (CFS) has something special on its website. A *Canada Student Loan Debt clock* lets you watch student debt adding up across the country. *Tick-tick tick-tick tick-tick tick-tick tick-tick...*

CANADA STUDENT LOAN DEBT

\$16,699,861,138

This represents only debt owed for Canada Student Loans and excludes debt owed for provincial and private student loans.

[CLICK HERE TO LEARN MORE ABOUT STUDENT DEBT IN CANADA](#)

The Skills Gap... How about Canada???

News · Canada

Clampdown on student debts leads to bump in collections for government

CRA collection efforts were ramped up two years ago after the government decided that loan writeoffs had spun out of control.



Liberals move to write student loans
Last year, the government wrote off 33,967
The Canadian Press Posted: Feb 14, 2017 4:17 PM ET | Law

The federal government...
last year totalling \$176 million

CANADA
March 27, 2017 3:14 pm
The number of bankrupts

Updated: March 28, 2017 8:31 am
Canadians going bankrupt over student debt

Global News
Email Print
payday loans
cheques cashed
WESTER UNION

OPEN
I could use an extra \$1,500
Payday loans up to \$1,500
Add us now

expensive debt
Canadian Press

The Skills Gap... it's a growing problem

Three Players:

- The Employer
- The Job Seeker
- Academia



The Skills Gap... it's a growing problem

The Employer

- Complain about a shortage of qualified workers
- Hiring managers want workers that are immediately productive
- 49 % of employers site... Lack of job specific skills **IBM i & RPG?**
- Only 24% of employers agree that lack of on the job training causes a shortage

WHAT DO YOU FEEL IS CAUSING THE SKILLS GAP?

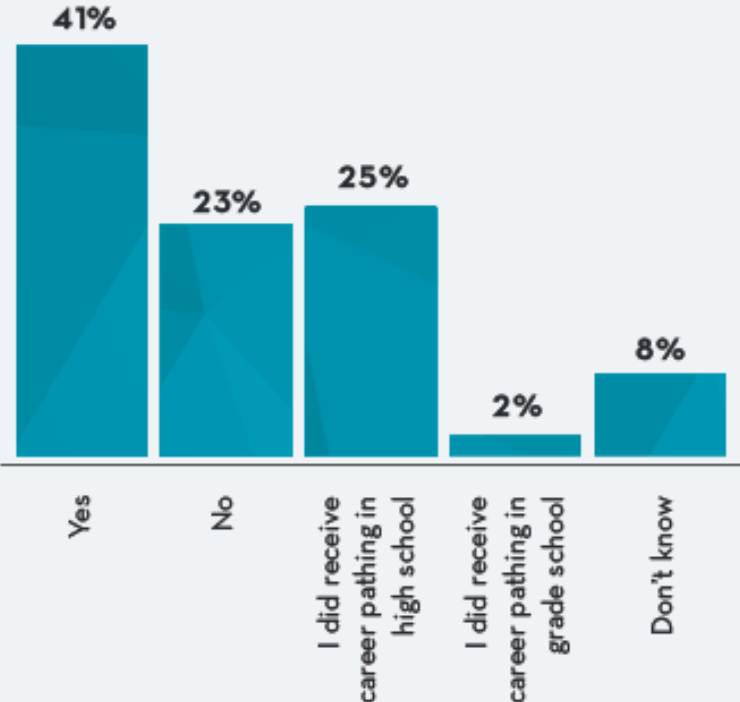


The Skills Gap... it's a growing problem

The Job Seeker

- Today's youth are told to "Follow your dreams"
- Little education about the entry level positions available to them
- 44% of college graduates under 25 hold jobs requiring less than a college degree.

DO YOU WISH YOU HAD RECEIVED SOME CAREER PATHING IN GRADE SCHOOL OR HIGH SCHOOL WHERE YOU WERE ADVISED TO GO INTO A CERTAIN FIELD?



The Skills Gap... it's a growing problem


Academia

- 96% of academics think they should communicate with potential employers about their curriculum
- Only 45% polled report doing so on a regular basis
 - This communication is often is a biyearly meeting to tell employers about the college curriculum changes
- Changes to college curriculum often takes 2 – 3 years.
- By the time the curriculum is changed the class is no longer relevant

Failure To Modernize Students Today

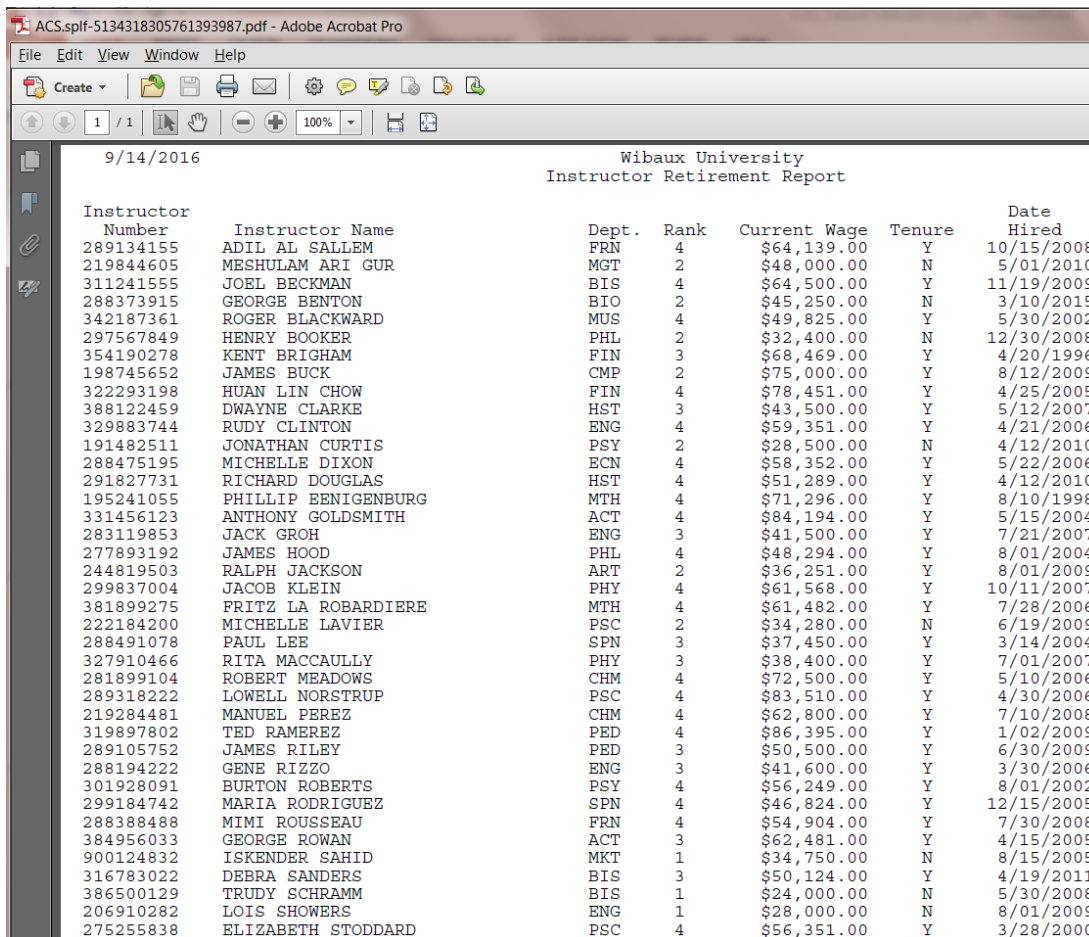


jbuck@impowertechnologies.com

 J_Buck51

Would a Student Want to Code...

- Employee payroll report
- Order Entry Application



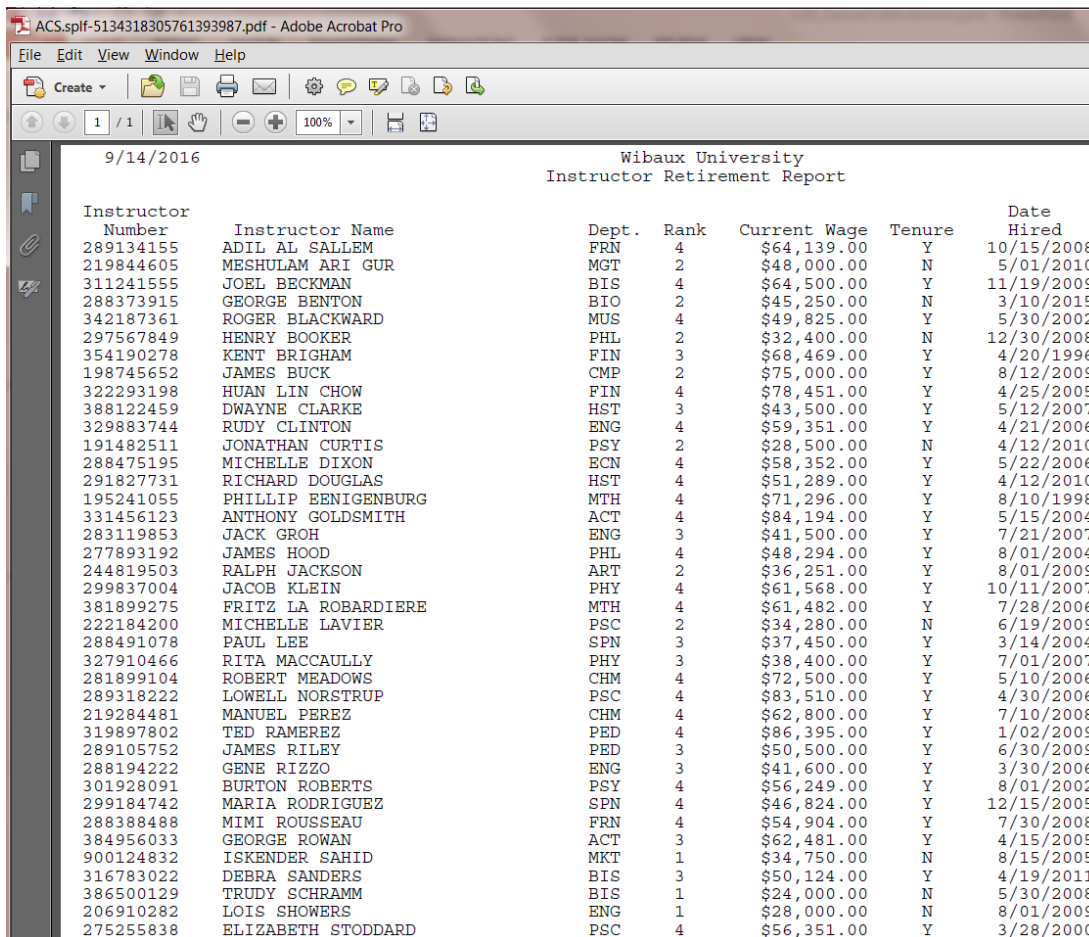
9/14/2016

Wibaux University
Instructor Retirement Report

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289134155	ADIL AL SALLEM	FRN	4	\$64,139.00	Y	10/15/2008
219844605	MESHULAM ARI GUR	MGT	2	\$48,000.00	N	5/01/2010
311241555	JOEL BECKMAN	BIS	4	\$64,500.00	Y	11/19/2009
288373915	GEORGE BENTON	BIO	2	\$45,250.00	N	3/10/2015
342187361	ROGER BLACKWARD	MUS	4	\$49,825.00	Y	5/30/2002
297567849	HENRY BOOKER	PHL	2	\$32,400.00	N	12/30/2008
354190278	KENT BRIGHAM	FIN	3	\$68,469.00	Y	4/20/1996
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322293198	HUAN LIN CHOW	FIN	4	\$78,451.00	Y	4/25/2005
388122459	DWAYNE CLARKE	HST	3	\$43,500.00	Y	5/12/2007
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Would a Student Want to Code...

- Employee payroll report Or...
- Order Entry Application



9/14/2016

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- Employee payroll report
- Order Entry Application

Or...

- \$1M iPhone App
- \$100M Online Game of the century

ACS.sp1f-5134318305761393987.pdf - Adobe Acrobat Pro

File Edit View Window Help

Create [Icons]

1 / 1 [Navigation Icons] 100%

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Students Think..

"I'll write one program & I'm done!"



Enterprise System Topics are Not “Sexy!”

- What’s cool about enterprise systems?
 - Usually a “*Boring*” business application
- IBM is out of business
 - They used to make good typewriters
- People talk about dead systems
 - AS400
 - iSeries
 - System i



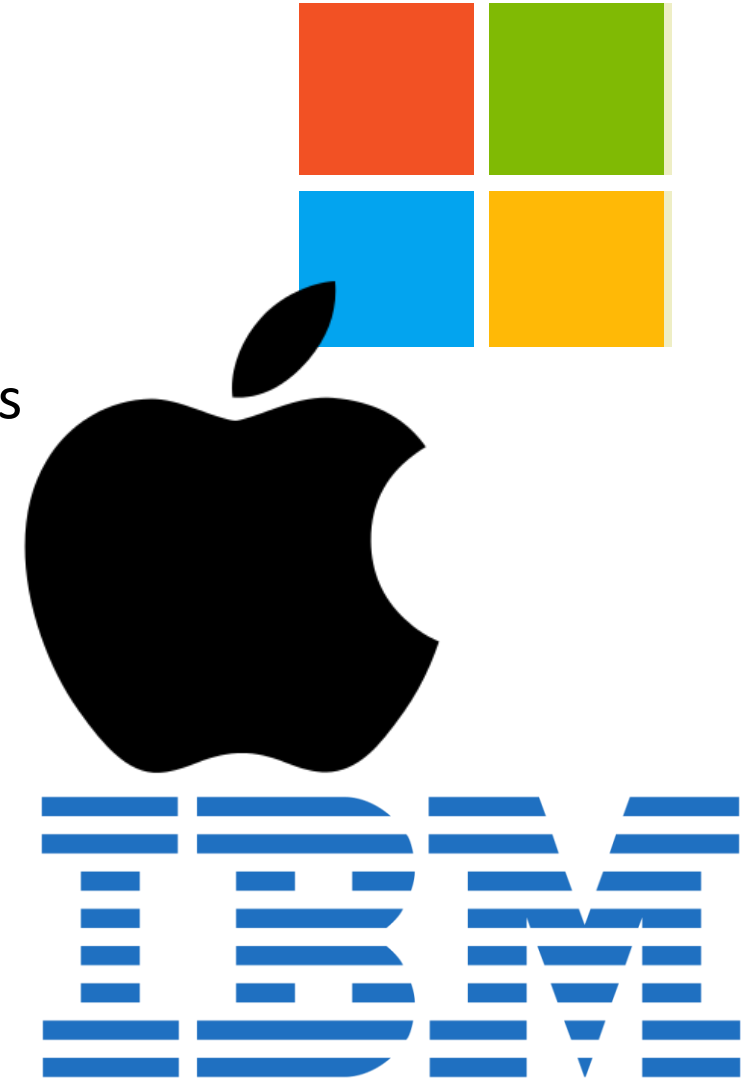
Enterprise System Topics are Not “Sexy!”

- RPG & COBOL are old...
 - No one uses those languages
 - Why would I want to learn this *“Old Stuff?”*
- Most students have had limited interaction with business
- Student life & the world’s processing is on their iPhone
- Recent Sprint Advertisement!
 - *“Now that your life is on your phone!”*



Students Don't Understand the Big Picture

- They Grew up with Microsoft & Apple
- I asked a first semester class
 - “What is IBM’s business?”
 - Three had never heard of IBM
 - Five students didn’t have a clue what the company does
 - Most said “Something to do with computers?”
 - They are rarely exposed to Enterprise systems
 - Except in History Books!
- Even a Gateway IT program advisor
 - “IBM is out of business!”
 - “Why does the Software Developer program teach IBM classes?”
 - He thought Lenovo bought IBM!



Perception of a Mainframe



Perception of a Mainframe



Perception of Cloud Computing



Would a Young IT Professional Work for You?




Failure To Modernize

How To Fail



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 J_Buck51

80's Tools & Techniques

A close-up photograph of an IBM AS/400 server rack. The rack is dark grey or black. At the top, there is a glowing orange light panel. Below the light panel, the IBM logo and the text "AS/400" are visible on the front of the rack. The IBM logo consists of eight horizontal stripes of varying lengths, and the text "AS/400" is in a sans-serif font. The lighting is dim, with the primary light source being the orange glow from the top panel.

IBM AS/400

Use 80's Tools & Techniques

```
      AAAA          SSSSSSS // 444          00000          00000
    AAA AAA      $$$   $$$ // 444          000 000          000 000
  AAA  AAA      $$$           // 444          000 000          000 000
 AAA  AAA      $$$           // 444          000 000          000 000
 AAA  AAA      $$$           // 444 444          000 000          000 000
AAAAAAAAAAAA      $$$ // 444444444          000 000          000 000
 AAA  AAA      $$$ $$$ //           444          000 000          000 000
 AAA  AAA      SSSSSSS //           4444          000000          000000
```

Sistema : NYAS400
Subsistema : SPECIAL
Pantalla : DSPTST

Usuario:
Contraseña:

Use 80's Tools & Techniques

```
Columns . . . :      6  76          Edit          FRLIB/QRPGLESRC
SEU==> _____ NEWTEST2
      ***** Beginning of data *****
0001.00 FTESTFILE  IF   E           K DISK
0002.00 FNEWFILE   0   A E           DISK
0003.00 ** Where FIELD1 is an Alpha Field
0004.00 ** Where FIELD2 is a Numeric Field of Consecutive (1,2,3,4) numbers
0005.00 C          KEY              Klist
0006.00 C                      KFld          FIELD1
0007.00 C                      KFld          FIELD2
0008.00 * Read the first 1000 customers for "ATSALOT"
0009.00 C                      EVAL          FIELD1 = 'ATSALOT'
0010.00 C                      EVAL          FIELD2 = 1
0011.00 C          KEY              Setll    TESTFILE
0012.00 C                      DoU          FIELD2 >= 1000
0013.00 C                      Read        TESTFILE          9999
0014.00 C                      IF          *IN99 = *0n OR
0015.00 C                      FIELD2 > 1000
0016.00 C                      LEAVE
0017.00 C                      ENDIF
0018.00 C                      WRITE        NEWFILE
0019.00 C                      EndDo
0020.00 C                      Eval          *INLR = *0n
```


Use 80's Tools & Techniques



Failure to Modernize

- Deal with dwindling “AS400” professional resources
 - Higher costs to work on your “Old stuff”
 - Business costs because your system cannot adapt to changes
- Overseas skills
 - Next generation of IT professionals will “PASS” on your company
 - Will there always be “Unlimited” foreign workers
- Eventually \$\$\$\$\$\$\$.
 - Complete rewrite or migration
 - Different software and/or platform.




Failure To Modernize

What You Can Do



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 J_Buck51

What Your Company Can Do

- Work with high schools & college's
- Understand that young people will not work with old technologies
 - Modernize to attract young IT professionals.
 - They are excited about helping to move your company forward.
- Offer Internships & jobs
- Support academic & industry organizations



Become involved with Education

- Support Enterprise Education
- Talk to students about enterprise systems
 - Visit colleges, high schools & middle schools
- Volunteer to help high schools & colleges
 - Computer systems and software
 - Help them with curriculum that will help business
- Typically, instructors don't interact well with businesses.
 - Most haven't been involved in business for years... if ever
 - Take one to lunch or offer to help with a class.
 - Help them understand what is going on in industry

Lend Technical Resources to Colleges

Where are the resources.. A recent example!

Subject: Re: Problem with new ILE coding

Never mind on this.....I went ahead and contacted IBM and I needed to turn off the 'Syntax Checker' since I was using SEU. / are wondering.....yes we have RDi loaded, but are still having issues with the licensing per my previous email to you. I have person that set up our SWMA and find out what to do in order to get that resolved. Thanks!

From: [REDACTED]
Sent: Thursday, September 1, 2016 10:00:46 AM
To: Jim Buck
Subject: Problem with new ILE coding

Hey Jim! I am trying to create a very simple program using the new format, but I am receiving errors and from what I read or they did not apply all the PTFs required when I upgraded last May. Can you please look at the screenshot below and the errc you think that is the case?

```
SEU==>
FMT ** ... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+...
***** Beginning of data *****
0001.00 DCL-F GTCSTP DISK USAGE(*INPUT);
0002.00 DCL-F GTCSTPAP PRINTER USAGE(*OUTPUT) OFLIND(EndOfPage);
0003.00
0003.01 Dcl-s EndOfPage Ind Inz(*0n);
0017.02 READ GTCSTP;
0017.04 DOH NOT %EOF(GTCSTP);
```

Young People Won't Work with OLD Technology

- Your company **MUST** develop a modernization plan
 - The software & tools to modernize are available
- Less expensive to modernize than
 - Changing platforms
 - Completely rewriting your system
- Modernization
 - Keep your Core Business Logic
 - Modernize your Database
 - Modernize your User Interface



Young People Won't Work with OLD Technology

Modernization Steps

- Start slow
- Concentrate on one area
- Model, View, Controller architecture
- Be prepared for the next “Final Solution!”



Tools are Available



Replace your "Retro" Code

```
Columns . . . : 6 76          Edit          FRLIB/QRPGLESRC
SEU==> _____ NEWTEST
      ***** Beginning of data *****
0001.00 FTESTFILE  IF  E          K DISK
0002.00 FNEWFILE  0  A E          DISK
0003.00 D XX              S          5  0
0004.00 ** Where FIELD1 is an Alpha Field
0005.00 ** Where FIELD2 is a Numeric Field of Consecutive (1,2,3,4) numbers
0006.00 C          KEY          Klist
0007.00 C          Kfld          FIELD1
0008.00 C          Kfld          FIELD2
0009.00 C          For          XX = 1 to 1000
0010.00 C          EVAL          FIELD1 = 'ATSALOT'
0011.00 C          EVAL          FIELD2 = XX
0012.00 C          KEY          CHAIN          TESTFILE          99
0013.00 C          IF          *IN99 = *Off
0014.00 C          WRITE          NEWFILE
0015.00 C          ENDIF
0016.00 C          EndFor
0017.00 C          Eval          *INLR = *On
      ***** End of data *****
```

¹ As Michelle Lyons refers to the old stuff!

Use RDi & Modern RPG

The screenshot displays the IBM Rational Developer for i environment. The main window shows a project structure on the left, a source code editor in the center, and an error list at the bottom. The source code is for a program named 'STATICSQLS' and includes control options, file definitions, and procedure definitions. The error list shows several messages related to unreferenced indicators.

```
000102 // Control Options =====*
000103 Ctl-Opt Option(*NoDebugIO);
000104 Ctl-Opt DftActGrp(*No);
000105 //=====*
000108 // Program Name . . : STATICSQLS *
000109 // Description . . . : Lists out the CUSTOMER Table *
000113 // By . . . . . : Jim Buck *
000114 // Date . . . . . : 01/10/2016 *
000115 //=====*
000116 // File Definitions *
000117 //=====*
000118 Dcl-f CustListp Printer Usage(*Output) OfInld(Endofpage);
000119 //=====*
000120 // Procedure Definitions *
000121 //=====*
000122 Dcl-pr Main ExtPgm('STATICSQLS');
000123 *N Char(2);
000125 End-Pr;
000126
000127 Dcl-pi Main;
000128 StateParm Char(2);
000130 End-Pi;
000131
```

ID	Message	Severity	Line	Location	Connection
i RNF7031	The name or indicator SQL_00047 is not referenced.	00	120	RPGWORK/QRPGSQLSRC(STATIC...	Deathstar - Power
i RNF7031	The name or indicator SQL_00049 is not referenced.	00	120	RPGWORK/QRPGSQLSRC(STATIC...	Deathstar - Power
i RNF7031	The name or indicator SQL_00050 is not referenced.	00	120	RPGWORK/QRPGSQLSRC(STATIC...	Deathstar - Power
i RNF7031	The name or indicator SQL_00051 is not referenced.	00	120	RPGWORK/QRPGSQLSRC(STATIC...	Deathstar - Power
i RNF7031	The name or indicator SQL_00027 is not referenced.	00	86	RPGWORK/QRPGSQLSRC(STATIC...	Deathstar - Power

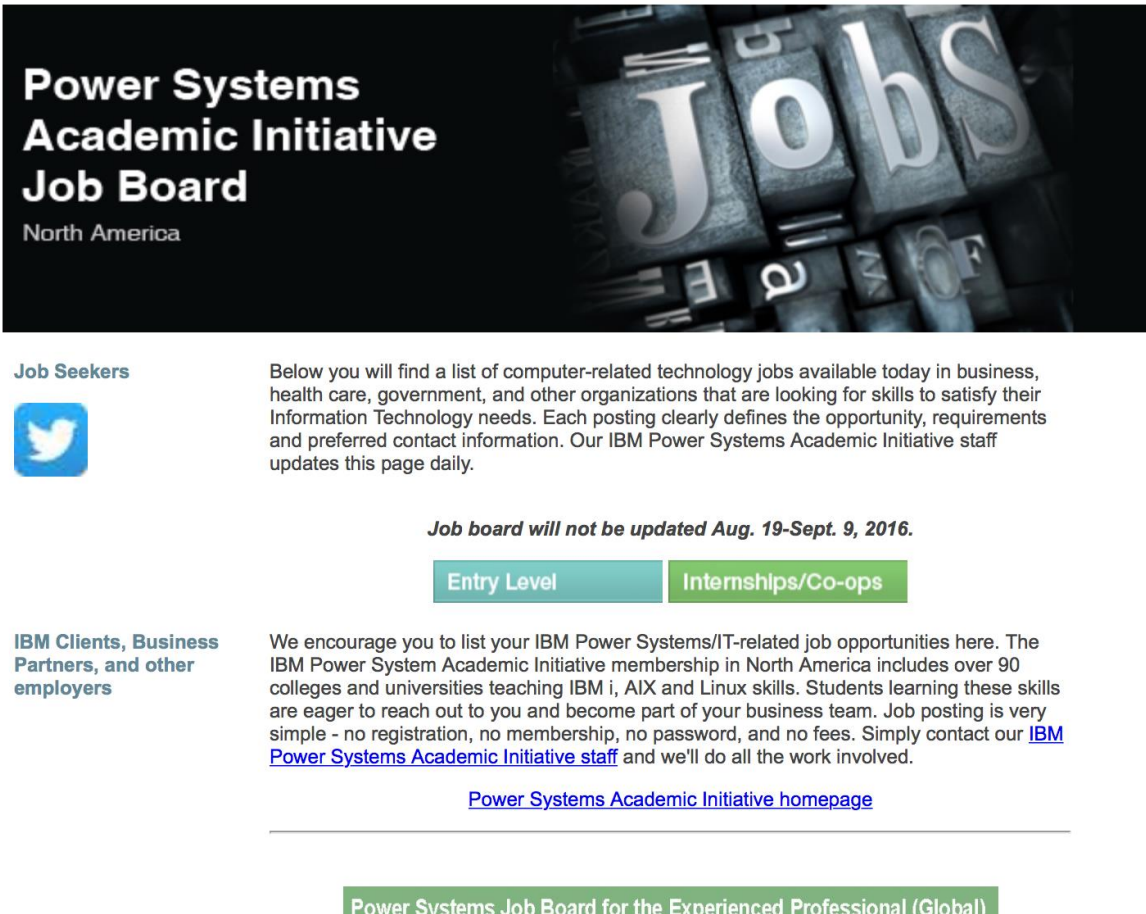
Offering Internships & Jobs

- What are the Benefits of Young IT Professionals?
- New skills
 - PHP, HTML, JavaScript
- Many new technologies are second nature to young people
- You will teach young IT professionals your business
 - Retirements lose technical skills
 - Retirements lose business knowledge
- Old timers will learn from the youngsters and vice versa!




IBM Power Systems Academic Initiative

- Contact IBM & tell them your concern
- Post your jobs on IBM's job board



Power Systems Academic Initiative Job Board
North America

Job Seekers



Below you will find a list of computer-related technology jobs available today in business, health care, government, and other organizations that are looking for skills to satisfy their Information Technology needs. Each posting clearly defines the opportunity, requirements and preferred contact information. Our IBM Power Systems Academic Initiative staff updates this page daily.

Job board will not be updated Aug. 19-Sept. 9, 2016.

[Entry Level](#) [Internships/Co-ops](#)

IBM Clients, Business Partners, and other employers

We encourage you to list your IBM Power Systems/IT-related job opportunities here. The IBM Power System Academic Initiative membership in North America includes over 90 colleges and universities teaching IBM i, AIX and Linux skills. Students learning these skills are eager to reach out to you and become part of your business team. Job posting is very simple - no registration, no membership, no password, and no fees. Simply contact our [IBM Power Systems Academic Initiative staff](#) and we'll do all the work involved.

[Power Systems Academic Initiative homepage](#)

[Power Systems Job Board for the Experienced Professional \(Global\)](#)

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- Contact IBM & tell them your concern
- Post your jobs on IBM's job board
- Check out the colleges on the PSAI web site

IBM Power Systems Academic Initiative
Educating the next Power Systems generation!

US & Canada | Europe, Middle East, Africa | Latin America | Asia Pacific

Our participating schools are listed alphabetically by State. To be included in this list or to find out more about these schools, please send a note to powerskills@us.ibm.com.
Last updated July 17, 2016.

States and provinces with participating schools



↓ Alabama	↓ Kentucky	↓ North Dakota
↓ Arizona	↓ Louisiana	↓ Ohio
↓ Arkansas	↓ Maryland	↓ Oklahoma
↓ California	↓ Massachusetts	↓ Oregon
↓ Colorado	↓ Michigan	↓ Pennsylvania
↓ Connecticut	↓ Minnesota	↓ South Carolina
↓ Delaware	↓ Mississippi	↓ Tennessee
↓ Florida	↓ Missouri	↓ Texas
↓ Georgia	↓ Nebraska	↓ Utah
↓ Guam	↓ Nevada	↓ Vermont
↓ Illinois	↓ New Hampshire	↓ Virginia
↓ Indiana	↓ New Jersey	↓ Washington
↓ Iowa	↓ New York	↓ Washington DC
↓ Kansas	↓ North Carolina	↓ Wisconsin

↓ Alberta, Canada | ↓ Newfoundland & Labrador, Canada | ↓ Ontario, Canada
↓ British Columbia, Canada | ↓ Nova Scotia, Canada | ↓ Quebec, Canada

[Contact the PSAI team](#)
→ Participating schools

PSAI job boards
⇌ Entry-level/internships (North America)
⇌ Experienced professionals (Global)

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→ Previously featured in the spotlight
→ Access our Power Systems Academic Cloud
→ Download software
→ Download courses (enterprise computing)

IBM Power Systems Academic Initiative

- Contact IBM & tell them your concern
- Post your jobs on IBM's job board
- Check out the colleges on the PSAI web site
- Contact a local college
 - ask them to participate in the IBM Power Systems Academic Initiative

**IBM Power Systems
Academic Initiative**

Educating the next Power Systems generation!

Welcome AIX IBM i Linux

For the last 20 years, the IBM Power Systems Academic Initiative (PSAI) has equipped educators with materials, technology, and resources to teach Power Systems skills that are needed by our clients worldwide. These resources include IBM courses, our Power Systems Academic Cloud, and entry-level and experienced professional job boards. Our PSAI materials can be easily integrated into any curriculum or course of study to teach a variety of

[Contact the PSAI team](#)
[Participating schools](#)

PSAI job boards
[Entry-level/internships \(North America\)](#)

Industry Organizations

- COMMON & Local user groups
 - The web has hurt these organizations...
 - The boss says “Can’t you watch a webinar or something?”
 - Attend conferences & learn new skills
 - Volunteer with COMMON
 - Volunteer with your local user group
 - Invite local Colleges to attend user group events
 - College Administrators
 - Instructors
 - Students



Thank you once again for the wonderful learning opportunity for us to attend the COMMON conference. The sessions are so interesting and informative, and the opportunity to network with so many different professionals in the industry is invaluable. - Fall 2015 Student Attendee

**Help a student
start his or her
Power Systems
career off right**

**Make a tax-deductible
donation to help CEF send
students to the COMMON
Fall Conference & Expo**

Give Now

Questions or Comments



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Failure to Modernize... The Real Cost



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