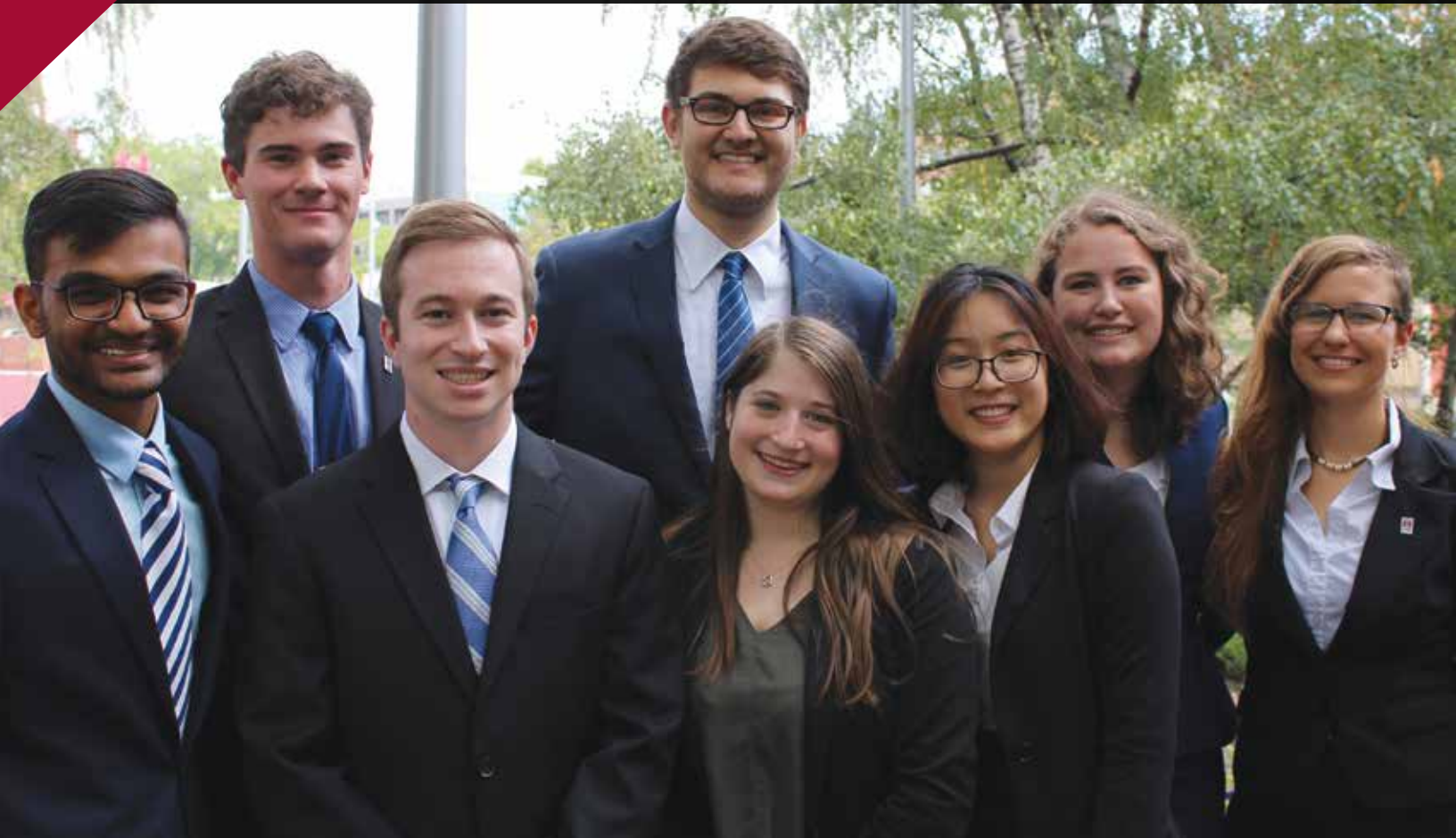# The IBIT Report

In Partnership with the Association for Information Systems

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Maria Boggi

The Association for Information Systems & Temple University, Fox School of Business

INFORMATION SYSTEMS JOB INDEX

2017

LEARN ABOUT CAREERS IN INFORMATION SYSTEMS

ASSOCIATION FOR **INFORMATION SYSTEMS**

Fox School of Business
TEMPLE UNIVERSITY ®

INFORMATION SYSTEMS JOB INDEX 2017

The IBIT Report

The IBIT Report is a publication for the members of the Fox School's Institute for Business and Information Technology. IBIT reports provide actionable knowledge to industry based on rigorous academic research and vendor neutral analysis. Each report focuses on an important topic of interest to our members.

ibit.temple.edu

About the Job Index

The AIS-Temple Fox School Information Systems Job Index is the only systematic assessment of IS placement, demographics, type of jobs, search, acceptance, geographical patterns, and knowledge level of more than 2100 information systems (IS), management information systems (MIS), and computer information systems (CIS) recent graduates from 58 universities across the nation.

isjobindex.com

Sponsors

Thanks to the following organizations for making the 2017 report possible.

Report Highlights

STUDENT HIGHLIGHTS

Page 17: Information Security Analyst for Bachelor's and Software/Application Development jobs for Master's **receive the highest salaries.** Data/Analytics jobs are the most common.

Page 19: An internship **almost doubles** the likelihood of getting a job offer.

PARENT HIGHLIGHTS

Page 10: Salaries for IS graduates are **higher than typical business majors** for both Bachelor's and most Master's degrees.

Page 18: Bachelor's IS placement is **more than 50% higher** than the national cumulative placement rate.

FACULTY HIGHLIGHTS

Page 20: IS Bachelor's received **significantly higher salary offers** when they report advanced IS, business, and foundational knowledge in contrast to just awareness or literacy.

Page 18: Placement for Master's IS students was **significantly lower at graduation** than in previous years but caught up at the six month mark.

EMPLOYER HIGHLIGHTS

Page 19: Fairness is the **most important reason** that graduates accept or reject a job offer.

Page 13: The percentage of females in IS are **about double** compared to other STEM fields such as Computer Science.

2017 IS Snapshot

About the IS Industry

Information Systems (IS) professionals apply and develop Information Technology (IT) in organizations, and comprise a significant portion of the IT labor market.

WHO ARE THESE PROFESSIONALS AND WHAT DO THEY DO?

- System and Business Analysts
- Application & Software Developers
- Data Analysts
- Chief Information Officers (CIO) & Chief Technology Officers (CTO)

They focus on **technology** and a domain of application and are experts in developing, applying, modifying, and strategizing technology to leverage new **IT enabled opportunities.** IS professionals work with other business professionals relying on computer scientists and engineers to create platforms while focusing on applying requirements and integrating technologies to **design solutions** that **solve business problems** and **lead digital strategy & innovation.**

The 2017 IS Job Market is Healthy

Job Placement Rate

	At Graduation	6-Months after Graduation
Bachelor's:	**74%**	**85%**
Master's:	**39%**	**74%**

Confidence in Job Market

Bachelor's: **68%**
Master's: **52%**

Average Salary

Bachelor's: **$62,820**
Master's: **$72,517**

Bachelor's in IS

A bachelor's in IS is in the **top 5 business degrees** and **top 10 degrees overall** demanded by employers. (Nace, 2018)

Master's in IS

A master's in IS is among the **top 5 graduate degrees** demanded by employers. (Nace, 2018)

ABOUT THE IS JOB MARKET

In 2017, there were an estimated 3 million jobs in the U.S. relevant to IS.

There are approximately **1,300 IS programs** in the U.S., which are typically offered in **Business Schools**, as well as in a few standalone Information Schools or integrated with Computer Science. IS programs are classified as **STEM** and are typically called:

- Management Information Systems (MIS)
- Information Systems (IS)
- Computer Information Systems (CIS)

The recruitment, mindset, education, demographics, career paths, skills, and jobs of IS professionals are different and yet remain poorly understood. Despite its large and growing size, the IS labor market is largely hidden because it is mixed with computer scientists and computer engineers.

IS Students are Happy About Their Future Jobs

Average IS salaries have **increased about 9%** since 2015.

Enthusiasm about Job Offer
Bachelor's: **81%**
Master's: **60%**

Offer from Appealing Organization
Bachelor's: **84%**
Master's: **74%**

Thanks to **34 universities** across the nation that agreed
to formally participate in the IS Job Index.

KOGOD SCHOOL *of* BUSINESS
AMERICAN UNIVERSITY • WASHINGTON, DC

JAMES MADISON UNIVERSITY.

UIS

ASU Arizona State University

LSU

THE UNIVERSITY OF MEMPHIS.
Fogelman College
of Business & Economics

BaruchCOLLEGE
ZICKLIN SCHOOL OF BUSINESS

SPEARS
SCHOOL OF BUSINESS

CARLSON SCHOOL
OF MANAGEMENT
UNIVERSITY OF MINNESOTA

BOSTON COLLEGE

SJSU | LUCAS COLLEGE AND
GRADUATE SCHOOL OF BUSINESS

DEPARTMENT OF
INFORMATION TECHNOLOGY
& DECISION SCIENCES
College of Business
UNT

cba
COLLEGE OF
BUSINESS ADMINISTRATION
CALIFORNIA STATE UNIVERSITY, LONG BEACH

Fox School of Business
TEMPLE UNIVERSITY ®

UNCG
Bryan School of
Business and Economics

Carnegie Mellon University
HeinzCollege
INFORMATION SYSTEMS • PUBLIC POLICY • MANAGEMENT

THE UNIVERSITY OF ALABAMA®

UNLV
LEE BUSINESS SCHOOL

CENTRAL • CONNECTICUT
STATE • UNIVERSITY
1849

THE UNIVERSITY OF ARIZONA
Eller MIS

The UNIVERSITY *of* OKLAHOMA
PRICE
COLLEGE OF BUSINESS
Management Information Systems

CLEMSON
U N I V E R S I T Y

UNIVERSITY OF
ARKANSAS | Sam M. Walton College of Business

TEXAS
The University of Texas at Austin

FIU | Business
FLORIDA INTERNATIONAL UNIVERSITY

CU Business School
UNIVERSITY OF COLORADO DENVER

UT DALLAS

GeorgiaState University
J. MACK
ROBINSON
COLLEGE
OF BUSINESS

UCONN | SCHOOL OF BUSINESS

UNIVERSITY *of* DAYTON

VCU
School of Business

IOWA STATE UNIVERSITY

UNIVERSITY OF
GEORGIA
1785 | Terry College of Business

WRIGHT STATE
UNIVERSITY

Legend

- Pacific
- Mountain
- West North Central
- East North Central
- West South Central
- East South Central
- New England
- Mid-Atlantic
- South Atlantic
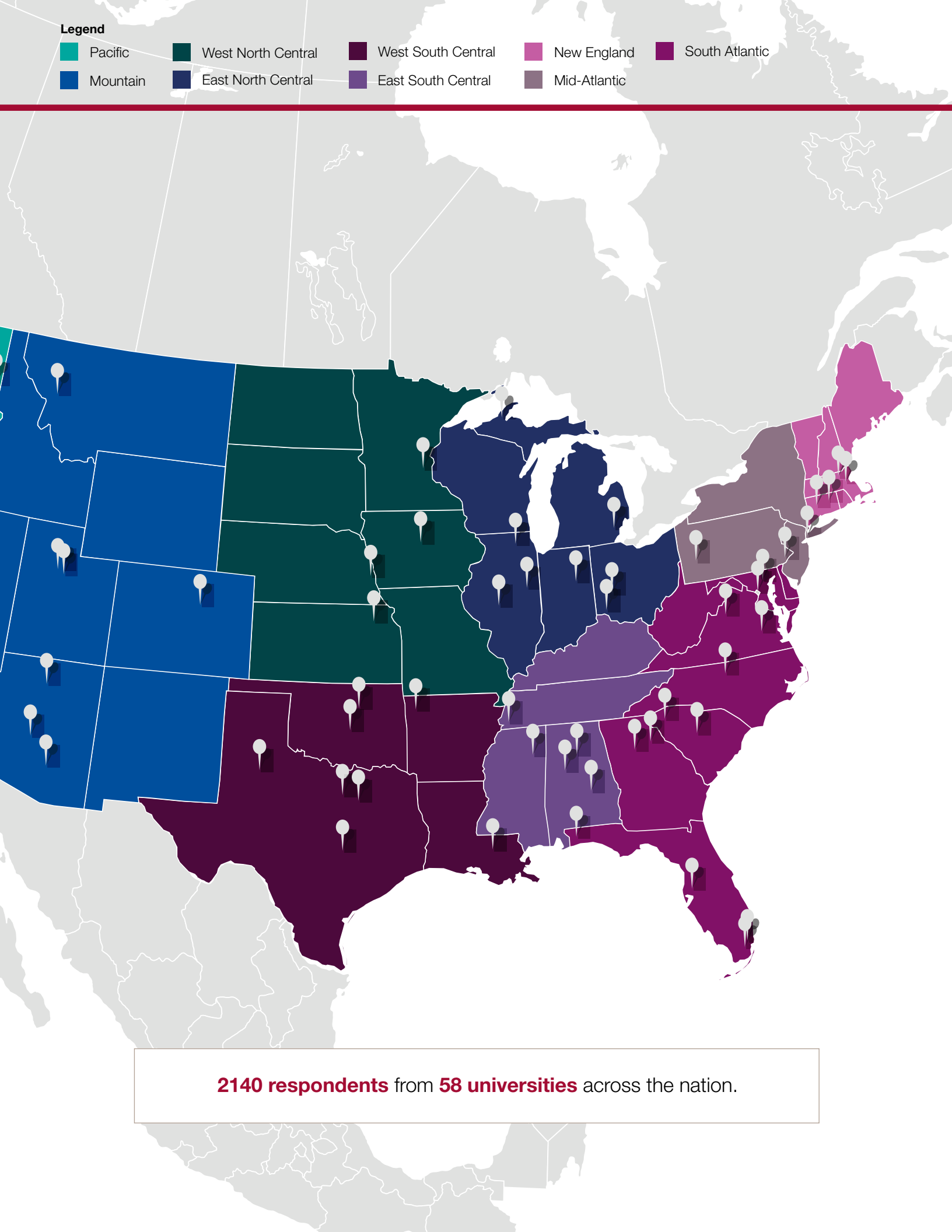
2140 respondents from **58 universities** across the nation.

Profile of an IS Student
FAST FACTS

A quick look at the
2017 Graduating Class

UNDERGRADUATE	**GRADUATE**
Age 23	Age 28
About 2.75 Years of Experience	About 4.5 Years of Experience

The 2017 IS graduating class is **about 60% male.**

Bachelor's
39%
Master's
36%

Bachelor's
61%
Master's
64%

The percentage of female IS graduates is **up 7 percentage points** from 2013.

Read more about the slowly vanishing gender gap in IS **on page 13.**

In 2017, the Bachelor's graduating class is about half **White** and increasingly **Asian.**

7%
Black

50%
Caucasian

10%
Hispanic

27%
Asian

6%
Other
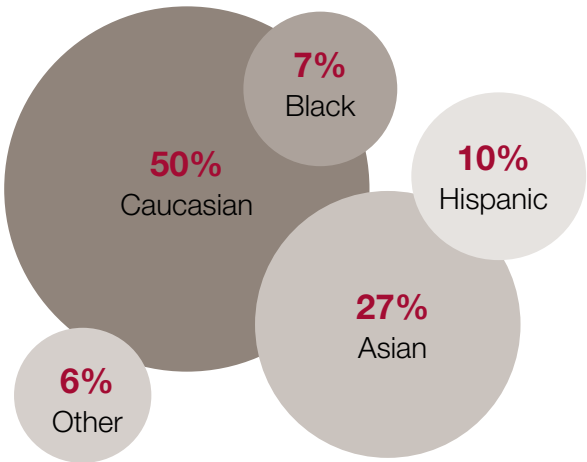
Read more about how IS student's ethnicities compare to other fields and about Master's students **on page 13.**

PLACEMENT

Bachelor's
AT GRADUATION   6 MONTHS AFTER GRADUATION

74%   85%

Master's
AT GRADUATION   6 MONTHS AFTER GRADUATION

39%   74%

Read more about what impacts placement **on pages 13, 18 and 19.**

Salaries & Offers OVERVIEW

The average offer **increased** for both bachelor's and master's students from 2013 to 2017.

BACHELOR'S

2013	$57,212
2015	$57,817
2017	$62,820

21% higher than the average offer to business school graduates at **$52,047**
(Nace, Spring 2017)

MASTER'S

2013	$65,394
2015	$67,632
2017	$72,517

3% higher than the average offer to business school graduates at **$74,551**
(Nace, Spring 2017)

Salaries for IS graduates **are higher than typical business majors** for both Bachelor's and most Master's degrees.
(Nace, 2017)

Overall, IS salaries are **growing slowly** in contrast to the high demand and high placement.

BACHELOR'S

INFORMATION SYSTEMS	$62,820
ACCOUNTING	$53,539
FINANCE	$55,974
MARKETING	$44,858

MASTER'S

INFORMATION SYSTEMS	$72,517
ACCOUNTING	$57,429
FINANCE	$71,766
MARKETING	$67,903

AmerisourceBergen Corporation

AmerisourceBergen is a global pharmaceutical sourcing and distribution services firm focused on improving patient access to products and enhance patient care. Ranked #11 on the Fortune 500, the firm has $145 billion in annual revenue with about 19,000 employees.

Dale Danilewitz, currently executive vice president and chief information officer has been leading the digital transformation of the firm since 2012. Danilewitz's vision is to create an enablement culture so that the 1,000 or so IT employees (plus about 1,000 contractors) are focused on business outcomes, services, engagement with customers in the field, and stay open to challenging norms and taking risks.

Under Danilewitz's leadership, the firm has made a concentrated effort to recruit and engage the next generation of IT workers out of college. IT drives its own talent strategy, focusing on information systems programs that tend to produce well-rounded graduates compared to computer science. The firm values digital natives with expertise in technology as well as communication, problem solving, and a desire to engage with others.

According to Danilewitz "the younger generation is attracted to firms with purpose" so the healthcare mission and values of AmerisourceBergen are a positive in recruitment, while the company wide digital transformation generates excitement. It is also important to remain authentic with new hires by showing consistency and sincerity of purpose (e.g., by engaging in community service), while allowing motivated high performers to express themselves in special projects.

The talent strategy is about building for the long-term. It recognizes that the younger generation are more direct about their needs, will move jobs frequently so the strategy is more about creating a positive environment for high performers than

Location and space are important aspects of recruitment. New offices are close to public transportation and urban areas.

about retention statistics. Still, the overall retention numbers are above the industry norm. The strategy also focuses on partnerships with select academic institutions to engage prospective hires early through an extensive internship program as well as mentorship, projects, and speaking in classes.

Location and space are important aspects of recruitment. New offices are close to public transportation and urban areas, while workspaces are more open to support agile and collaborative work that requires informal interaction.

There is also recognition of work-life balance in that employees have some flexibility on their hours, however, according to Danilewitz "workers also need to understand that engagement is difficult to achieve at home." The corporate network is open to day-to-day personal 'life' activities such as social media and banking, recognizing that the distinction between home and work is becoming more fluid.

The strategy and techniques to bring in new blood have also affected established workers, who over time embraced the open spaces and other changes. For the future, and consistent with the new open culture, Danilewitz is considering replacing formal annual performance reviews with short weekly updates between managers and supervisors.

Salaries & Offers *by* REGION

Region	BACHELOR'S Movement Patterns From ↓	To ↑	BACHELOR'S Salary	Salary Change 2015	2013	MASTER'S Movement Patterns From ↓	To ↑	MASTER'S Salary	Salary Change 2015	2013
PACIFIC	5%	37%	$69,988	17%	26%		90%	$90,847	58%	
MOUNTAIN	34%	8%	$61,350	28%	12%	27%	8%	$71,531		10%
WEST NORTH CENTRAL	14%		$57,722		5%		67%	$65,000	2%	30%
EAST NORTH CENTRAL	15%	43%	$65,652	26%	23%	50%	79%	$71,852	19%	14%
NEW ENGLAND	29%	4%	$65,760	5%	11%		75%	$79,000	-6%	13%
MID-ATLANTIC	12%	49%	$66,308	5%	22%	59%	36%	$73,880	-4%	33%
SOUTH ATLANTIC	10%	19%	$62,994	8%	8%	21%	38%	$66,849	16%	27%
EAST SOUTH CENTRAL	64%		$52,143	-8%	-5%	50%	38%	$66,333	-7%	-6%
WEST SOUTH CENTRAL	17%	18%	$60,531	3%	6%	42%	16%	$71,991	3%	11%

Notes: There was insufficient data to report on the cells with missing data. 'Move from' is location of university, 'move to' is location of accepted job.

39% of Master's and **22%** of Bachelor's IS students move to a job **outside the region** in which they got their degree.
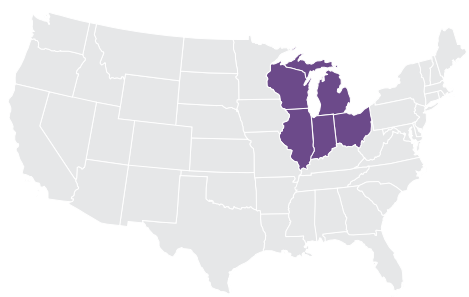
The **East North Central** region has shown consistent and **significant salary increases** over time of over 20% for Bachelor's and near 20% for Master's IS students.
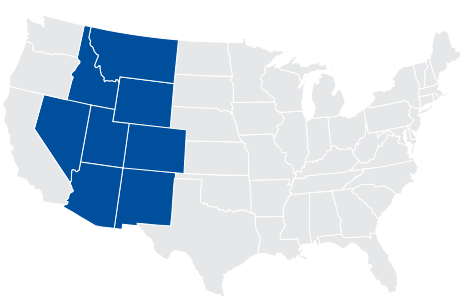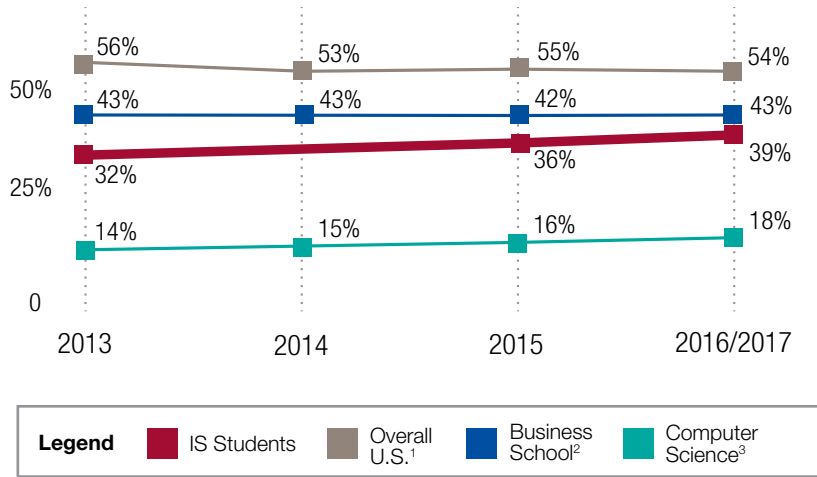

Bachelor's students in the **Mountain** region saw the **highest increase in salary** of 28% compared to 2015.

Representation *by* GENDER AND INTERNATIONAL STUDENTS

**Female representation continues to improve year to year in IS.**

BACHELOR'S

Legend — IS Students | Overall U.S.[1] | Business School[2] | Computer Science[3]

	2013	2014	2015	2016/2017
Overall U.S.	56%	53%	55%	54%
Business School	43%	43%	42%	43%
IS Students	32%		36%	39%
Computer Science	14%	15%	16%	18%

MASTER'S

	2013	2014	2015	2016/2017
Overall U.S.	60%	57%	60%	56%
Business School	47%	47%	49%	48%
IS Students	31%		34%	36%
Computer Science	27%	29%	29%	29%

The percentage of females in IS are **about double** compared to other STEM fields such as Computer Science.

Gender based salary differences are **statistically insignificant.**[4]
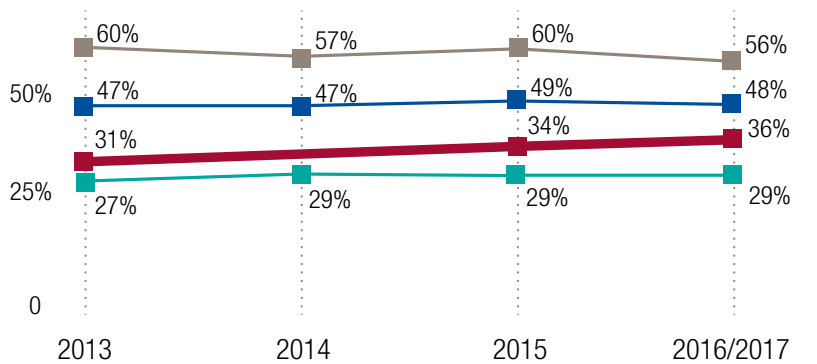
IS female job placement is **higher than males** for both Bachelor's (72% vs. 68%) and Master's (54% vs. 46%).

IS Domestic vs. International Students

7% **Bachelor's Degree** International Students

71% **Master's Degree** International Students

The majority of IS Master's are International students who are **subject to changes in visa policies**
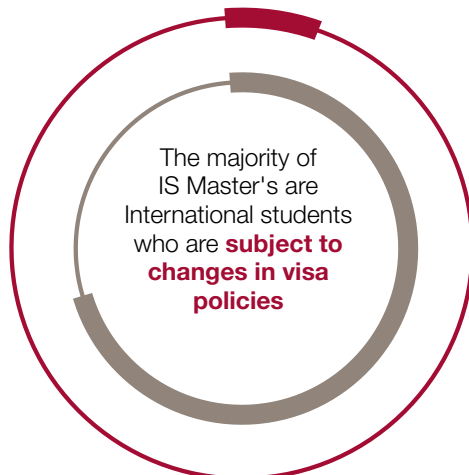
International IS Masters Placement

AT GRADUATION — 23%

6 MONTHS AFTER GRADUATION — 74%

Representation *by* ETHNICITY

In 2017, **race based salary differences** are statistically significant[3].

BACHELOR'S

INFORMATION SYSTEMS	50%	7%	27%	10%	6%
COMPUTER SCIENCE[1]	51%	4%	24%	8%	13%
BUSINESS SCHOOL[2]	54%	8%	7%	12%	18%
NATIONAL[4]	59%	15%	8%	18%	1%

Legend ■ White ■ Black ■ Asian ■ Hispanic ■ Other

MASTER'S

INFORMATION SYSTEMS	17%	5%	73%	3%	3%
COMPUTER SCIENCE	18%	2%	7%	2%	72%
NATIONAL	60%	15%	13%	10%	1%
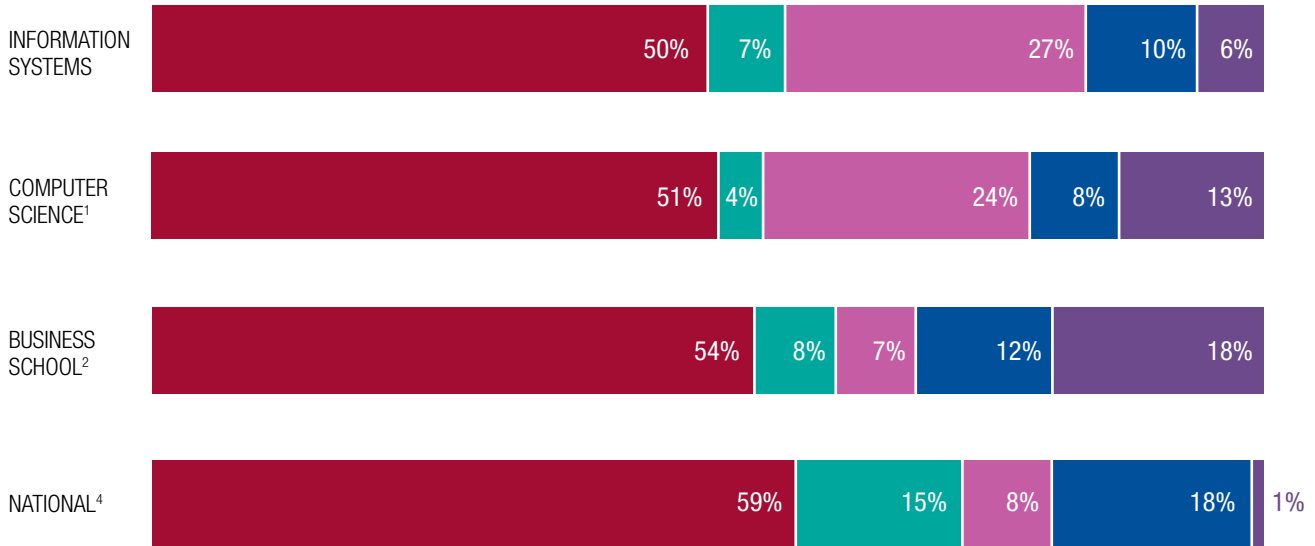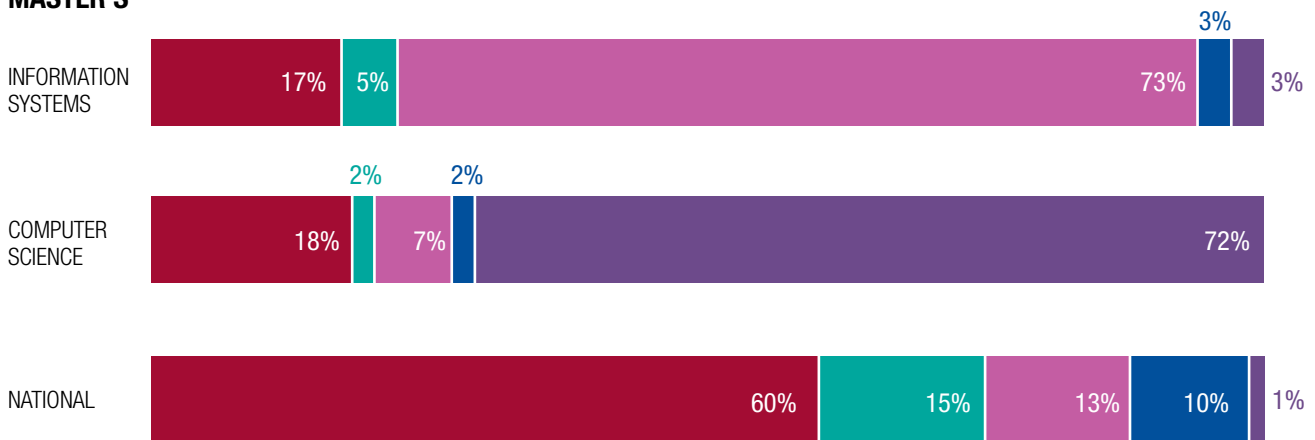
IS graduates include relatively **more Asians** and **fewer Blacks and Hispanics** than college students in general.

The ethnic breakdown of IS graduates is **comparable to Computer Science.**

Liquidhub, Inc.

LiquidHub is a digital experience service provider, co-founded by Jonathan Brassington, CEO and Partner in 2001. Their focus on technology, business services, and customer experience has led to rapid growth. Ranked #67 on *Forbes* list of 'most promising companies', the firm has 19 offices and about 3,000 employees worldwide.

As CEO, Brassington leads rapid growth working closely with Recruiting, which is a key entrepreneurial partner. As a professional services firm, they need talent that can contribute immediately in engaging with clients. This lends itself to a recruiting strategy that focuses more on experienced professionals rather than recent college hires, although they do still hire college graduates.

According to Brassington, "entry-level type workers are more demanding and direct about what they need while being more open to learning and doing different kinds of things in the near term." This is in sharp contrast to the traditional model of developing a consistent set of skills over a long term. Entry level expect to change jobs every 2 years or so; "they have a 'gig'economy perspective."

The talent strategy is flexible to accommodate growth. Entry-level hires go into a leadership development program, whose goal is to get them in front of clients as soon as possible. This program has worked well, while the internship program has had mixed success primarily because of the need for client engagement. New employees of 3-5 years of experience with specific skills, certifications, vertical or horizontal industry knowledge, go into an internal resource pool managed by Recruiting, supplemented as needed by contract firms.

liquidhub

Entry-level type workers are more demanding and direct about what they need while being more open to learning and doing different kinds of things in the near term.

As part of the talent strategy, LiquidHub completely redesigned its offices around the principles of transparency, openness, and collaboration. The floor plan is open; there are no closed-door offices. Brassington's desk is out in the open - the same as the rest of LiquidHub's Associates. The culture is evolving so that it is okay for others near your desk to hear conversations that in the past would occur behind closed doors. One consequence of this change is that disagreements and debates are more visible, this in turn has caused many to refine their approach to feedback, while others that did not buy into the open culture have left the firm. According to Brassington,"in a transparent culture, influenced by the openness and directness of millennials, it is even more important to let people go that do not fit or who are poor performers." Yet, they have a relatively low turnover for a professional services firm.

Location is a major consideration in the talent strategy. Brassington believes that to acquire and retain talent, they need to provide a city location. This is especially important for millennial and entry-level employees. As the firm continues to evolve, location will remain a key consideration in acquisition and growth plans.

Salaries & Offers *by* INDUSTRY

SALARY BY SIZE OF ORGANIZATION
Bachelor's Students

		% of Graduates
VERY SMALL (1-100 Employees)	$53,000	4%
SMALL (101-1,000 Employees)	$54,448	8%
MID-SIZED (1,001-5,000 Employees)	$59,265	11%
LARGE (5,001-10,000 Employees)	$60,404	11%
VERY LARGE (10,001 or more Employees)	$65,397	66%

77% of Bachelor's and **66%** of Master's IS graduates **accept jobs** in very large or large firms

SALARY BY SIZE OF ORGANIZATION
Master's Students

		% of Graduates
VERY SMALL (1-100 Employees)	$57,667	5%
SMALL (101-1,000 Employees)	$62,984	14%
MID-SIZED (1,001-5,000 Employees)	$73,561	16%
LARGE (5,001-10,000 Employees)	$68,893	8%
VERY LARGE (10,001 or more Employees)	$76,237	58%

BACHELOR'S | Salary Breakdown by Industry

INDUSTRY		% of Graduates
INFORMATION TECHNOLOGY	$66,314	21%
CONSUMER PRODUCTS / WHOLESALER / RETAILER / DISTRIBUTOR	$66,250	3%
FINANCIAL SERVICES / BANKING / ACCOUNTING	$63,708	15%
BUSINESS SERVICES / CONSULTING	$63,098	25%
INSURANCE / REAL ESTATE / LEGAL	$61,200	7%
BIOTECHNOLOGY / PHARMACEUTICAL / HEALTHCARE / MEDICAL	$60,502	7%
FEDERAL GOVERNMENT	$60,470	2%
MANUFACTURING	$56,765	4%

25% of IS Bachelors accept jobs in the Business Services / Consulting field

MASTER'S | Salary Breakdown by Industry

INDUSTRY		% of Graduates
FINANCIAL SERVICES / BANKING / ACCOUNTING	$77,725	10%
INFORMATION TECHNOLOGY	$77,297	27%
CONSUMER PRODUCTS / WHOLESALER / RETAILER / DISTRIBUTOR	$72,222	5%
BUSINESS SERVICES / CONSULTING	$69,808	13%
MANUFACTURING	$68,992	7%
BIOTECHNOLOGY / PHARMACEUTICAL / HEALTHCARE / MEDICAL	$65,768	6%
EDUCATION	$63,695	6%

Salaries & Offers *by* JOB TYPE

BACHELOR'S | Salary Breakdown by Job Type

JOB CATEGORY

INFORMATION SECURITY ANALYSTS
$70,591

OTHER IT/IS JOB CATEGORY
$68,872

SOFTWARE / APPLICATIONS DEVELOPERS
$66,589

INFORMATION TECHNOLOGY ADVISORS / CONSULTANTS
$65,338

PROJECT MANAGERS
$60,936

DATA ANALYTICS
$61,896

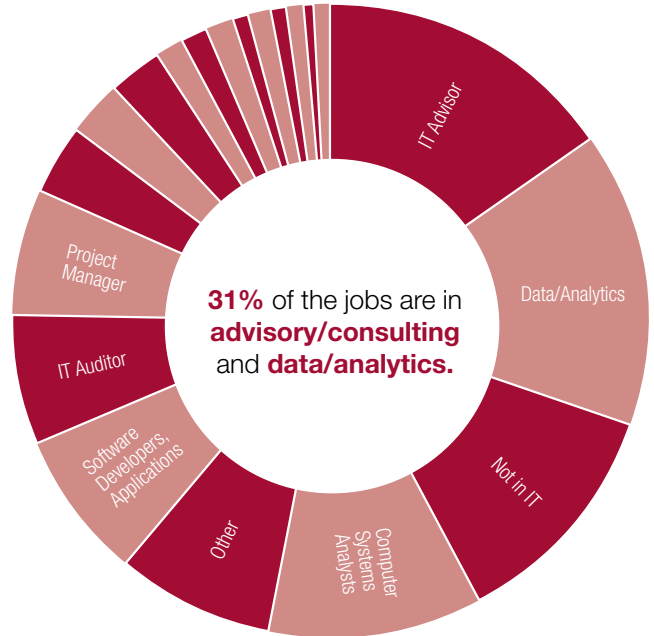**COMPUTER SYSTEMS ANALYSTS**
$61,542

INFORMATION TECHNOLOGY AUDITORS
$59,515

COMPUTER SUPPORT SPECIALIST
$43,034

Bachelor's salaries for Data, Security Analysts, and Application Developers have grown **34%, 21%,** and **18%** respectively since 2013

31% of the jobs are in **advisory/consulting** and **data/analytics.**

In 2013, **31% of Bachelor's IS students** received Systems Analyst offers, in 2017 this was down to **11%.**

MASTER'S | Salary Breakdown by Job Type

JOB CATEGORY

SOFTWARE / APPLICATIONS DEVELOPERS
$92,050

INFORMATION TECHNOLOGY ADVISORS / CONSULTANTS
$79,235

PROJECT MANAGERS
$76,385

DATA ANALYTICS
$71,263

INFORMATION SECURITY ANALYSTS
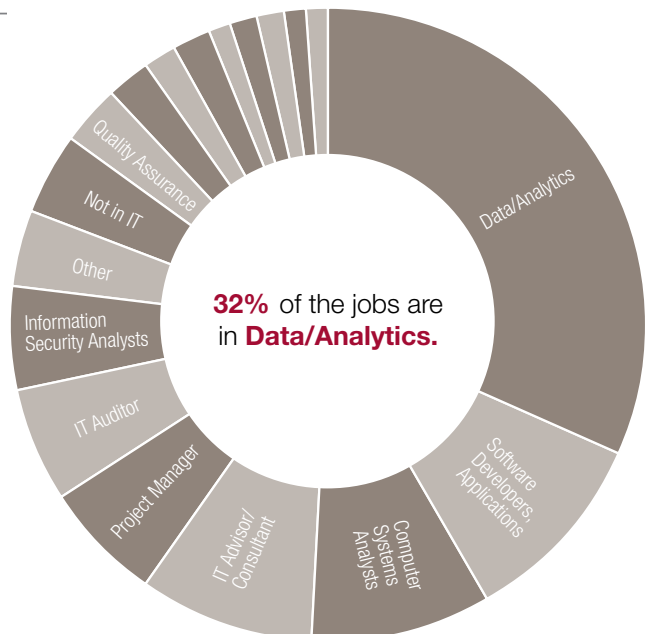$67,300

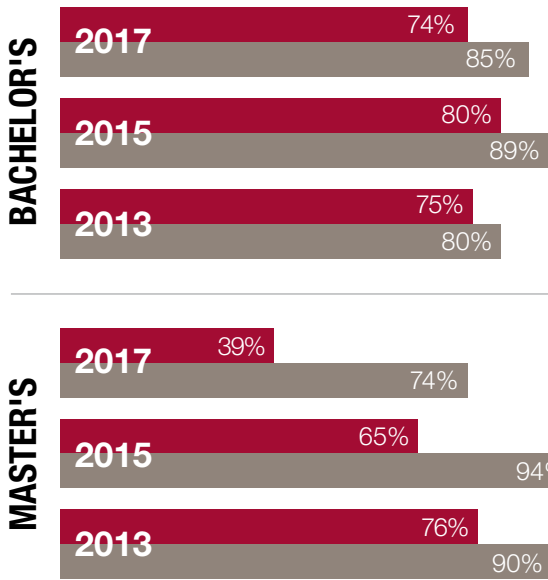**COMPUTER SYSTEMS ANALYSTS**
$66,763

INFORMATION TECHNOLOGY AUDITORS
$62,409

32% of the jobs are in **Data/Analytics.**

Master's salaries for Software Application Developers have grown **49%** since 2013

Placement & Experience

Job Placement [^]

BACHELOR'S

Legend:
- AT GRADUATION
- 6 MONTHS AFTER GRADUATION

2017 74% / 85%
2015 80% / 89%
2013 75% / 80%

MASTER'S

2017 39% / 74%
2015 65% / 94%
2013 76% / 90%

Bachelor's IS placement of 74% upon graduation and 85% six months post graduation is **significantly higher** than the national cumulative placement rate of 49%[3].
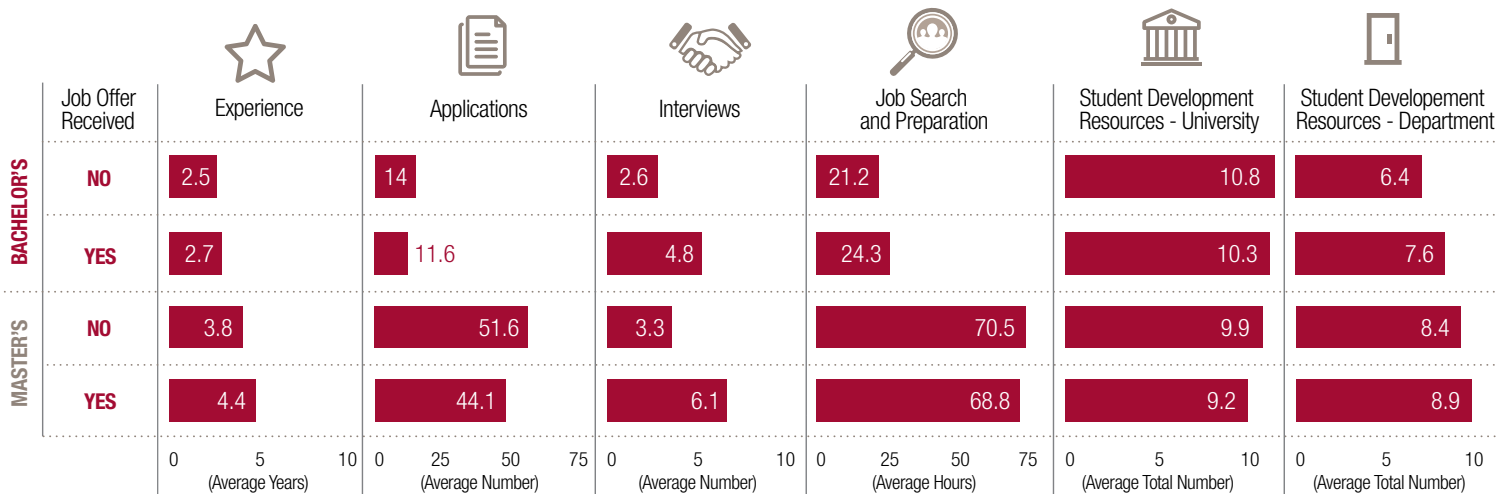
In 2017, **placement for Master's IS students** was **significantly lower at graduation** than in previous years but caught up at the six month mark.

Confidence in the job market has gone down from 70% in 2015 to 52% in 2017 in Master's IS graduates.

Placement in IS **continues to do well** over the last 5 years.

Departmental student **development resources matter more** for Bachelor's IS students than overall university resources

What Impact Offers?

		Experience	Applications	Interviews	Job Search and Preparation	Student Development Resources - University	Student Developement Resources - Department
BACHELOR'S	NO	2.5	14	2.6	21.2	10.8	6.4
	YES	2.7	11.6	4.8	24.3	10.3	7.6
MASTER'S	NO	3.8	51.6	3.3	70.5	9.9	8.4
	YES	4.4	44.1	6.1	68.8	9.2	8.9
		(Average Years)	(Average Number)	(Average Number)	(Average Hours)	(Average Total Number)	(Average Total Number)

^ Placement is based on student's reporting their job status at the time the survey was administered. The survey was distributed to the graduating or recently graduated students of each participating university during April - May 2017.Offers received after a particular student completed the survey are not reflected in the above analysis.

3. NACE 2017 Student Survey Report.

Offer—Acceptance & Internships

Why BACHELOR'S Accept/Reject Offers

ACCEPT	REJECT
MOST IMPORTANT REASONS	**MOST IMPORTANT REASONS**
Process Fairness	Process Fairness
Job Fit	Recruiter
Reputation	Reputation
LEAST IMPORTANT REASONS	**LEAST IMPORTANT REASONS**
Organization	Job
Job	Organization
Compensation	Job Fit

Why MASTER'S Accept/Reject Offers

ACCEPT	REJECT
MOST IMPORTANT REASONS	**MOST IMPORTANT REASONS**
Process Fairness	Process Fairness
Job Fit	Reputation
Reputation	Values
LEAST IMPORTANT REASONS	**LEAST IMPORTANT REASONS**
Compensation	Compensation
Organization	Job
Recruiter	Organization

DEFINITIONS

JOB: Challenging, interesting, enjoy, freedom

JOB FIT: Looking for, match, skills, requirements

COMPENSATION: Salary, bonuses, benefits

ORGANIZATION: Size, location, coworkers, supervisor, facilities, environment

VALUES: Culture, work/life, values

REPUTATION: Reputation, distinctive, prestigious

RECRUITER: Answer questions, knowledgeable, informative, valuable

PROCESS FAIRNESS: Timeliness, fairness, respect, helpfulness

HOW DO INTERNSHIPS EFFECT OFFERS?

BACHELOR'S

Internships	Receive Offers	
	NO	YES
0	48%	16%
1	36%	39%
2	12%	26%
>2	4%	20%

67% of Bachelor's IS graduates have **1 or more internships**

2.2 times more likely to get a job offer[1]

84% of the offers went to students with **1 or more internships**

MASTER'S

Internships	Receive Offers	
	NO	YES
0	56%	35%
1	26%	39%
2	14%	16%
>2	4%	12%

49% of Master's IS graduates have **1 or more internships**

1.7 times more likely to get a job offer[2]

65% of the offers went to students with **1 or more internships**

Knowledge Level vs. Salary

BACHELOR'S

Awareness/Literacy
$54,985
$53,790

Concept/Use
$59,485
$58,347

Detailed Advanced Knowledge
$65,533
$59,660

Legend ■ Information Systems ■ Business and Foundations

MASTER'S

Awareness/Literacy
$68,326
$72,750
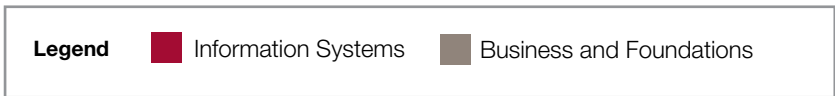
Concept/Use
$66,165
$67,641

Detailed Advanced Knowledge
$74,498
$69,315

SKILL LEVEL DESCRIPTIONS

LITTLE KNOWLEDGE

AWARENESS
Define, list characteristics, name components, list advantage/disadvantages

LITERACY
Can compare and contrast, explain, execute, define capabilities, describe interrelations, describe framework

CONCEPT/USE
Can use, communicate the idea of, form abstraction, extrapolate, list concepts, comprehension and ability to use the knowledge

DETAILED UNDERSTANDING/ APPLICATION ABILITY
Detailed understanding, search for and apply correct solution, design and implement, apply the principles, can select the right thing and use

ADVANCED
Develop, originate, construct, evaluate, judge relative value

Source: Topi et al. "IS 2010 Curriculum Guidelines..." CAIS, 2010

It Does Pay to Study: IS Bachelor's received **significantly higher salary offers** when they report advanced IS, business, and foundational knowledge in contrast to just awareness/literacy[1]

KNOWLEDGE DEFINITIONS

IS KNOWLEDGE

> Improving Organizational Processes

> Exploiting Opportunities Created by Technology Innovations

> Understanding and Addressing Information Requirements

> Designing and Managing Enterprise Architecture

> Identifying and Evaluating Solution and Sourcing Alternatives

> Software Development

> Securing Data and Infrastructure

> Understanding, Managing, and Controlling IT Risks

BUSINESS AND FOUNDATIONAL KNOWLEDGE

> Improving Organizational Processes

> Exploiting Opportunities Created by Technology Innovations

> Understanding and Addressing Information Requirements

> Designing and Managing Enterprise Architecture

> Identifying and Evaluating Solution and Sourcing Alternatives

> Software Development

> Securing Data and Infrastructure

> Understanding, managing, and controlling IT Risks

Source: Adapted from Topi et al. (2010) "IS 2010: Curriculum Guidelines…" CAIS, Vol. 26, Article 18, 2010

1. Independent Samples T-Test, 95% Confidence

Top and Bottom 3 Knowledge Self Ratings

BACHELOR'S

TOP 3

	2017	2015	2013
1	Communication	Communication	Communication
2	Analytical and Critical Thinking	Analytical and Critical Thinking	Analytical and Critical Thinking
3	Leadership and Collaboration	Leadership and Collaboration	Leadership and Collaboration

BOTTOM 3

	2017	2015	2013
1	Securing Data and Infrastructure	Securing Data and Infrastructure	Securing Data and Infrastructure
2	Designing and Managing Enterprise Architecture	Software Development	Designing and Managing Enterprise Architecture
3	Software Development	Designing and Managing Enterprise Architecture	Identifying and Evaluating Solution and Sourcing Alternatives

IS Bachelor's and Master's are **consistently confident** about their communication, leadership, collaboration, analytical, and critical thinking skills.

Verbal and written communication, problem solving, and ability to work in a team are the **top skills that employers seek** in candidates[2]

MASTER'S

TOP 3

	2017	2015	2013
1	Communication	Communication	Communication
2	Analytical and Critical Thinking	Analytical and Critical Thinking	Analytical and Critical Thinking
3	Leadership and Collaboration	Leadership and Collaboration	Understanding and Addressing Information Requirements

BOTTOM 3

	2017	2015	2013
1	Securing Data and Infrastructure	Securing Data and Infrastructure	Securing Data and Infrastructure
2	Understanding Managing and Controlling IT Risks	Designing and Managing Enterprise Architecture	Understanding Managing and Controlling IT Risks
3	Designing and Managing Enterprise Architecture	Software Development	Identifying and Evaluating Solution and Sourcing Alternatives

About the Authors

Dr. Munir Mandviwalla

Dr. Munir Mandviwalla is Associate Professor of Management Information Systems at the Fox School of Business, Temple University. He is also the Executive Director of the Institute for Business and Information Technology. Dr. Mandviwalla has published articles on collaborative systems, social media, virtual teams, software training, peer review, globalization, and universal access and use. His most recent work includes studies of design science, social media strategy, broadband policy, and industry academic collaboration.

His publications have appeared in *Management Information Systems Quarterly (MISQ), Information Systems Research (ISR), ACM Transactions on Computer Human Interaction, Journal of Management Information Systems (JMIS), Journal of the Association for Information Systems (JAIS), Information Systems Journal (ISJ), MIS Quarterly Executive (MISQE), Decision Support Systems (DSS), Small Group Research, Communications of the ACM (CACM),* and *Public Administration Review.*

His work has been supported by grants from the National Science Foundation (NSF), SIM Advanced Practices Council, Lockheed Martin, Bell Atlantic, IBM, Microsoft Corporation, CIGNA Corporation, Advanta Corporation, Lotus Development Corporation, and Lilly Endowment, Inc. Mandviwalla has taught the capstone course for the BBA in MIS at the Fox School, and the introduction to information systems course for the Fox School's MS Digital Innovation in Marketing, EMBA, and MBA programs. He has also taught executive education seminars on systems thinking for major firms such as NBCUniversal and QVC.

In 2000, IBM selected him for their Faculty Partnership Award in recognition for contributions to E-Business teaching and research. In 2002, The Claremont Graduate University recognized him with their Alumni Hall of Fame award. He received the Association for Information Systems Award for Outstanding Contribution to Information Systems Education in 2016. The students in the MS Digital Innovation in Marketing program selected him as Faculty of the Program in 2016.

Dr. Crystal Harold

Dr. Crystal Harold (PhD, Industrial/Organizational Psychology, George Mason University) is an Associate Professor in the Department of Human Resource Management at the Fox School of Business, Temple University. Prior to joining the Fox School of Business, she was an Assistant Professor in the Purdue School of Science at IUPUI and also worked as a Strategic Human Resources Consultant for numerous governmental agencies such as the Air Force, The National Geospatial-Intelligence Agency (NGA), and Department of the Interior (DOI).

Her research focuses on issues related to employee recruitment (in particular the role of PE fit and fairness) and the impact of management practices and characteristics that engender perceptions of workplace fairness and counterproductive behaviors. Her work appears in top OB/HRM outlets including *Journal of Applied Psychology, Personnel Psychology, Journal of Management,* and *Journal of Organizational Behavior.* She serves on the editorial boards of *Personnel Psychology* and the *Journal of Occupational and Organizational Psychology.* Findings from her research have been discussed in numerous media outlets including the CBS Early Show, Strategy + Business, The Telegraph, and The Chronicle of Higher Education. Dr. Harold was awarded a 2005 APA Dissertation Award and the HUMRRO Fellowship in I/O Psychology. In recognition of her research and teaching accomplishments, she was recently appointed a Cigna Research Fellow, a Dean's Teaching Fellow, and the Adrisani-Frank Undergraduate Teaching Award.

Maria Boggi

Maria Boggi is a rising junior studying Management Information Systems in the Fox School of Business, Temple University. She is in the Fox and University Honors program, a member of Phi Theta Kappa and Beta Gamma Sigma Honor societies, and the Dean's list.

At the start of her collegiate path, Maria started an alternative spring break program with the Norristown Crisis Intervention center to help educate students on the importance of mental health and provide opportunities to give back to the community. Professionally, Maria has worked as a server at Del Frisco's and Capital Grille restaurant groups where she rose to develop training programs for others and innovations to exceed guest expectations.

She recently received a university wide Creative Arts, Research and Scholarship (CARAS) grant to study the information systems job market. On track to graduate in 2019, Maria is currently working as a research assistant and diamond peer teacher. In the summer of 2017, Maria will intern at PwC's Philadelphia office as a Risk Assurance Advance Associate.

The IBIT Report

The IBIT Report is a publication for the members of the Fox School's Institute for Business and Information Technology. IBIT reports provide actionable knowledge to industry based on rigorous academic research and vendor neutral analysis. Each report focuses on an important topic of interest to our members.

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