



7th ADB International Skills Forum

December 13, 2017



This is not an ADB material. The views expressed in this document are the views of the author/s and/or their organizations and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy and/or completeness of the material's contents, and accepts no responsibility for any direct or indirect consequence of their use or reliance, whether wholly or partially. Please feel free to contact the authors directly should you have queries.

Agenda

- Overview of AWS and shift to the cloud
- Impact on the workforce
- A theory of intervention
- Our approach

What is Amazon Web Services, and what is the cloud?



How did
Amazon.com ...



...get into
cloud computing?



NIST* Definition of “Cloud Computing”

Model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction.



The AWS Definition of “Cloud Computing”

On-demand delivery of information technology (IT) resources via the internet with pay-as-you-go pricing.

* NIST = National Institute of Standards and Technology

AWS has millions of active customers each month

NETFLIX



The Weather Company



LIONSGATE™



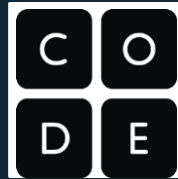
Kellogg's



MINICLIP



duolingo



Supporting Business of Education



We are confident in saying that
the AWS infrastructure has
performed exactly as intended.

Sharif Nijim

Enterprise Application Architect,
University of Notre Dame

- UND migrated website and global student and faculty authentication store to AWS with plans to move 80% of its workloads in the next three years.
- UND Reports 40% savings on IT operational costs annually.



[University of Maryland University College](#) (UMUC) needed to replace its legacy applications and decided to use AWS to run its new analytics platform as well as several administrative workloads. By using AWS, UMUC improved the performance of its analytics platform by **twentyfold** and enabled its engineers to focus on building new applications instead of managing IT infrastructure.



[Ivy Tech Community College of Indiana](#) is the largest community college in the United States. About 170,000 students register for classes each year; school maintains a student database with about 1.7 million records. School needed to scale existing systems, including operational data store (ODS). By leveraging AWS: Queries complete in as little as **three seconds, down from 40 minutes**; Licensing and monthly **operational costs are about 60 percent less**.

Using AWS, Open Universities Australia Develops Online Courses That Reach Over 100,000 Students Worldwide



THE **AWS CLOUD** HELPS
OPEN2STUDY **DELIVER**
ONLINE LEARNING TO STUDENTS
REGARDLESS OF WHERE
THEY ARE IN THE **WORLD.**

- Jose Herrera-Perea
Executive General Manager
Open2Study

- Open Universities Australia (OUA) is an aggregator of Australian universities and colleges that offers online distance learning services
- In late 2012, OUA decided to develop a massive open online course (MOOC) site called Open2Study
- By selecting AWS, OUA established an infrastructure capable of supporting several hundred thousand of global concurrent users
- OUA is also able to start developing new products and services within a day on the AWS Cloud and add them into production in two weeks

Webinar: Student First at UMUC Using Amazon WorkSpaces

WEBINAR: FEBRUARY 22, 2PM EST
STUDENTS FIRST:
HOW THE CLOUD HELPS UMUC
SIMPLIFY ACCESS TO EDUCATION

REGISTER NOW



Watch the webinar archive to learn how The University of Maryland University College uses Amazon WorkSpaces in a virtual environment. Students can learn anywhere, on the device of their choice, with the software tools required to complete assignments. This webinar features Dr. Kara Van Dam, Vice Provost of the Faculty and Learner Experience, and Greg Smith, Associate VP, Enterprise Operations from UMUC.

Watch Webinar Archive

“A majority of our students use Macs, but many business school applications require Windows. Amazon WorkSpaces eliminates the technical complexity for students and we can give them access to their applications in just seconds. Students have a unified learning experience.”

Piotr Zielinski

Director of Information Technology, School of Business
The George Washington University

Ivy Tech Meets Petabyte-scale Database Needs Using AWS



"We could not find any other database service that offers the affordability, scalability, and responsiveness that we get with

AWS."

Lige Hensley

Chief Technology Officer
Ivy Tech Community College of Indiana



- Needed to scale systems to efficiently manage, analyze tens of thousands of student records
- Uses Amazon Redshift, Amazon S3 as foundation for analytics services
- Easily scales to manage petabyte-scale database needs
- Queries completed in as little as three seconds, down from 40 minutes in the past
- Millions of dollars less expensive to acquire than other data warehouse solutions

Universities All-In on AWS



ND's Web Team
@NDWebTeam

Notre Dame is going “cloud first” with a goal of 80% IT service portfolio in next 3 years ntrda.me/1EckVBb

Software as a Service (SaaS) Platform as a Service (PaaS) Infrastructure as a Service (IaaS) On-Premises	Why SaaS & PaaS? Leverage high quality commodity solutions Maximize time spent to address unique ND needs Why IaaS? Pay only for the resources we use Add or remove resources quickly Avoid managing multiple physical data centers Why Amazon Web Services For IaaS? We will only turn to on-premises solutions when a service has Most advanced data centers in the world Proven pace of innovation	What Cloud First Means For YOU Timely access to the most advanced IT tools Opportunities for innovation and integration
---	--	--

5:16 PM - 7 Nov 2014



HARVARD UNIVERSITY
Information Technology

Harvard Cloud Services

Also known as: Amazon, AWS, Amazon Web Services, Elastic Compute Cloud, EC2, Simple Storage Service, S3.



Description

Amazon Web Services (AWS) for Harvard is the first deliverable of the [Harvard Cloud & DevOps Program](#) and provides a framework for accessing Amazon Web Services. AWS was selected as the anchor provider because of its significant user base in the Harvard Community and its prominence in the public cloud services market. Harvard has recently signed an enterprise-wide agreement with Amazon to provide cloud-based services to the Harvard community and to deliver a simple and efficient process to procure services in the “Cloud” at the most economical rate for Schools and Departments.

In the future, these capabilities may be extended to include other public cloud service providers (such as Google, Azure, or RackSpace) and internally built private cloud services based on user requirements and customer needs.



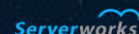
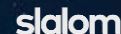
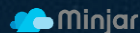
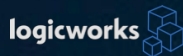
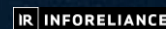
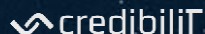
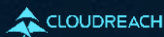
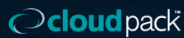
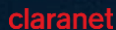
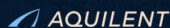
Largest Number Of Enterprise Customers



Largest Number Of Public Sector Customers



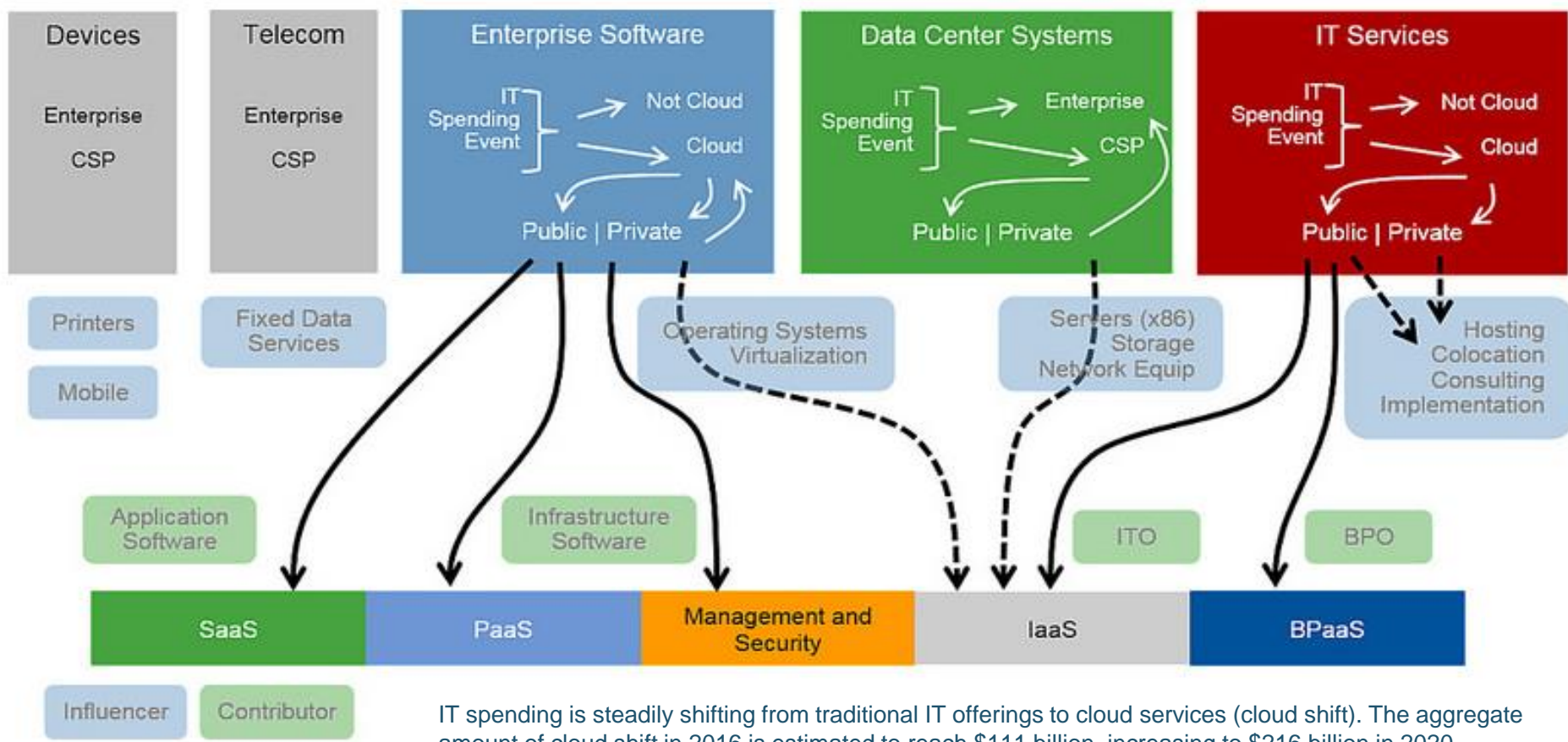
Broadest Ecosystem of System Integrators: Premier Consulting Partners



Broadest Ecosystem of ISVs



Figure 1: Shift From Traditional IT Spending to Cloud



IT spending is steadily shifting from traditional IT offerings to cloud services (cloud shift). The aggregate amount of cloud shift in 2016 is estimated to reach \$111 billion, increasing to \$216 billion in 2020.

Gartner Press Release, Gartner Says by 2020 "Cloud Shift" Will Affect More Than \$1 Trillion in IT Spending, July 20, 2016, <http://www.gartner.com/newsroom/id/3384720>

Source: Gartner (July 2016)

AWS is growing at a dramatic rate

\$16b yearly run rate

+42% y/y growth rate

“Cloud Computing” has been the #1
LinkedIn skill for two years in a row¹

And millions of jobs in the cloud!

Average AWS Certification Salary²:

AWS Certified Developer – Associate: \$138k

AWS Certified Solutions Architect- Associate: \$115k

AWS Certified SysOps Administrator – Associate - \$108k

¹ <https://blog.linkedin.com/2016/10/20/top-skills-2016-week-of-learning-linkedin>

² [Global Knowledge 2016 IT Skills and Salary Report](#)

**Sounds good.
What's the problem?**

We can't fill the demand for these jobs

Time to hire increased 80% from 2009 to 2015

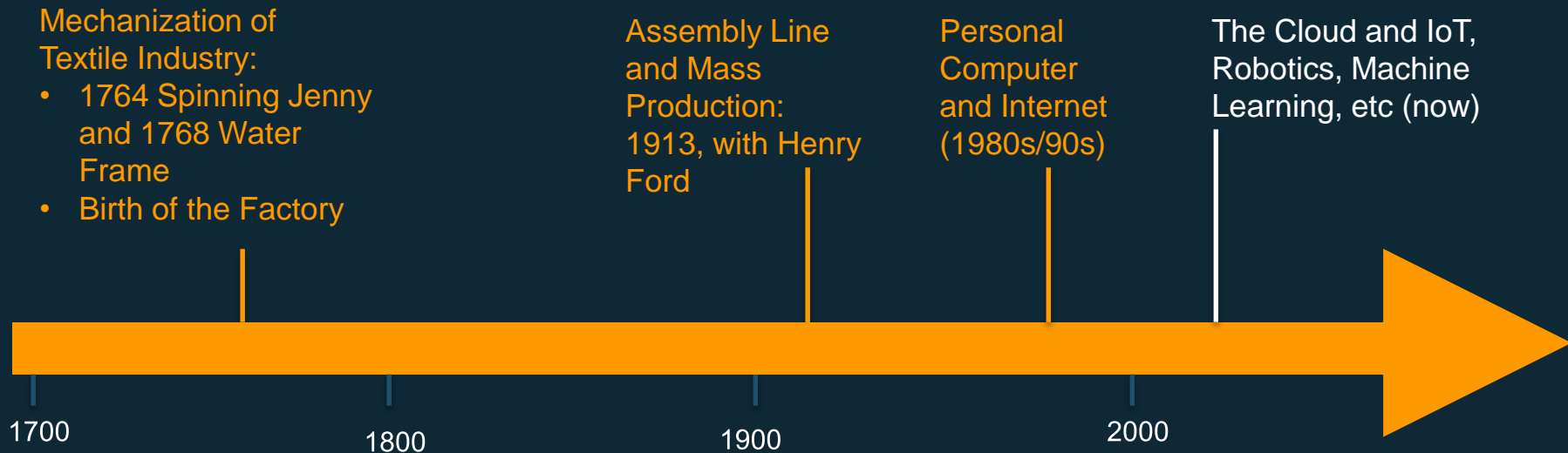
Tech jobs are some of the hottest and hardest to fill

To avoid mis-hires, companies are screening more heavily

Glassdoor report: https://research-content.glassdoor.com/app/uploads/sites/2/2015/06/GD_Report_3.pdf

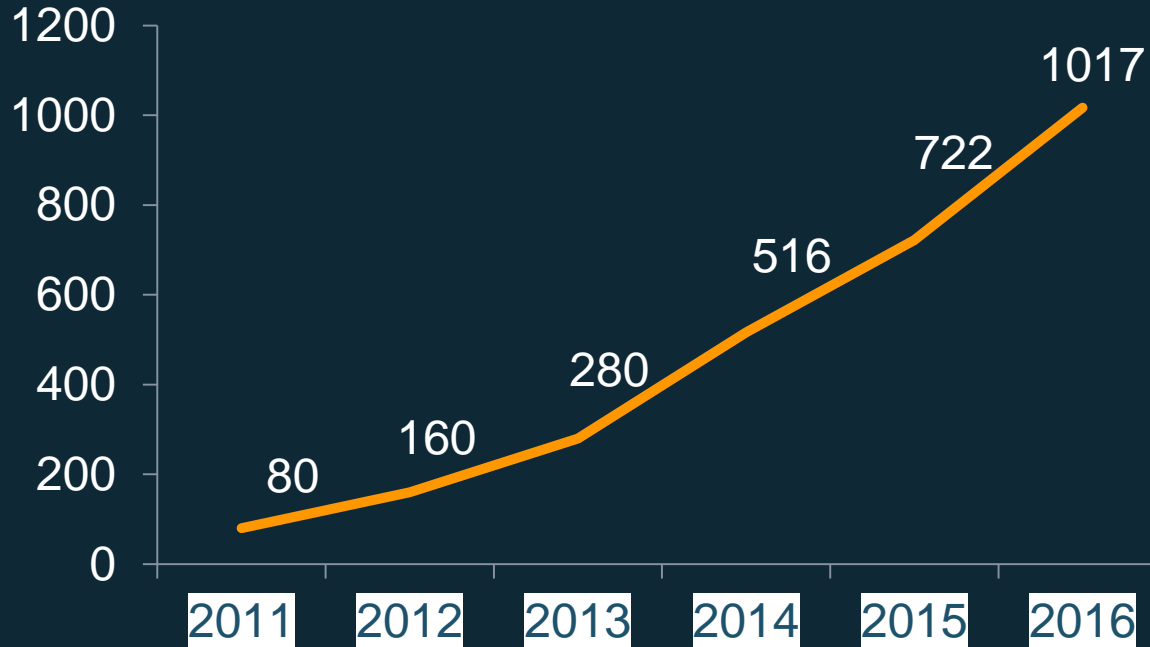
Shift to the Cloud: Workforce Implications

We're currently in 4th industrial revolution



Characterized by breathtaking pace of innovation...

AWS New Services / Features



...a shift toward new competencies...

“In recent years, a growing number of studies in economics show a marked shift away from low-skilled, routine jobs and toward **higher-skilled**, less routine positions **requiring judgment** and **technical skills**.”

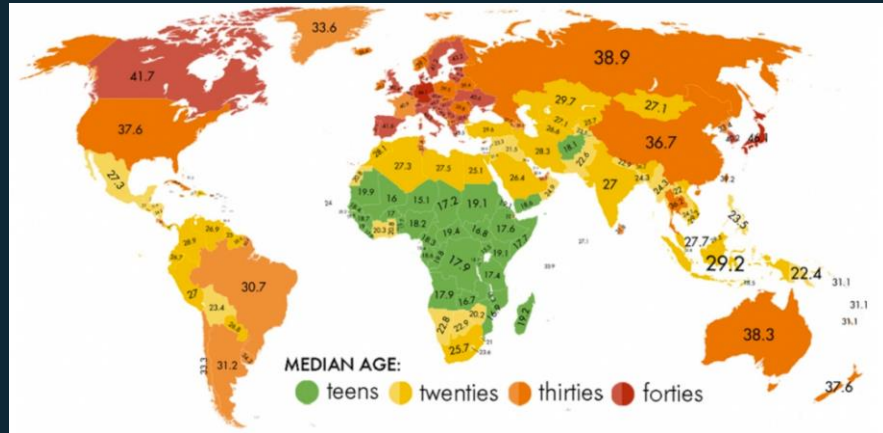
- Glassdoor's Chief Economist Chamberlain, 2015 study

... and education left out on an island to address gap.

MCKINSEY: The Massive Skills Gap Is Only Going To Get Worse Because Our Education Systems Are Broken

Regional context presupposes heterogeneous solutions

Example 1: Differences in population age create unique workforce solutions



Example 2: Existing skillsets and local industry must be addressed

From Coal To Code: A New Path For Laid-Off Miners In Kentucky

May 6, 2016 · 4:00 PM ET
Heard on All Things Considered

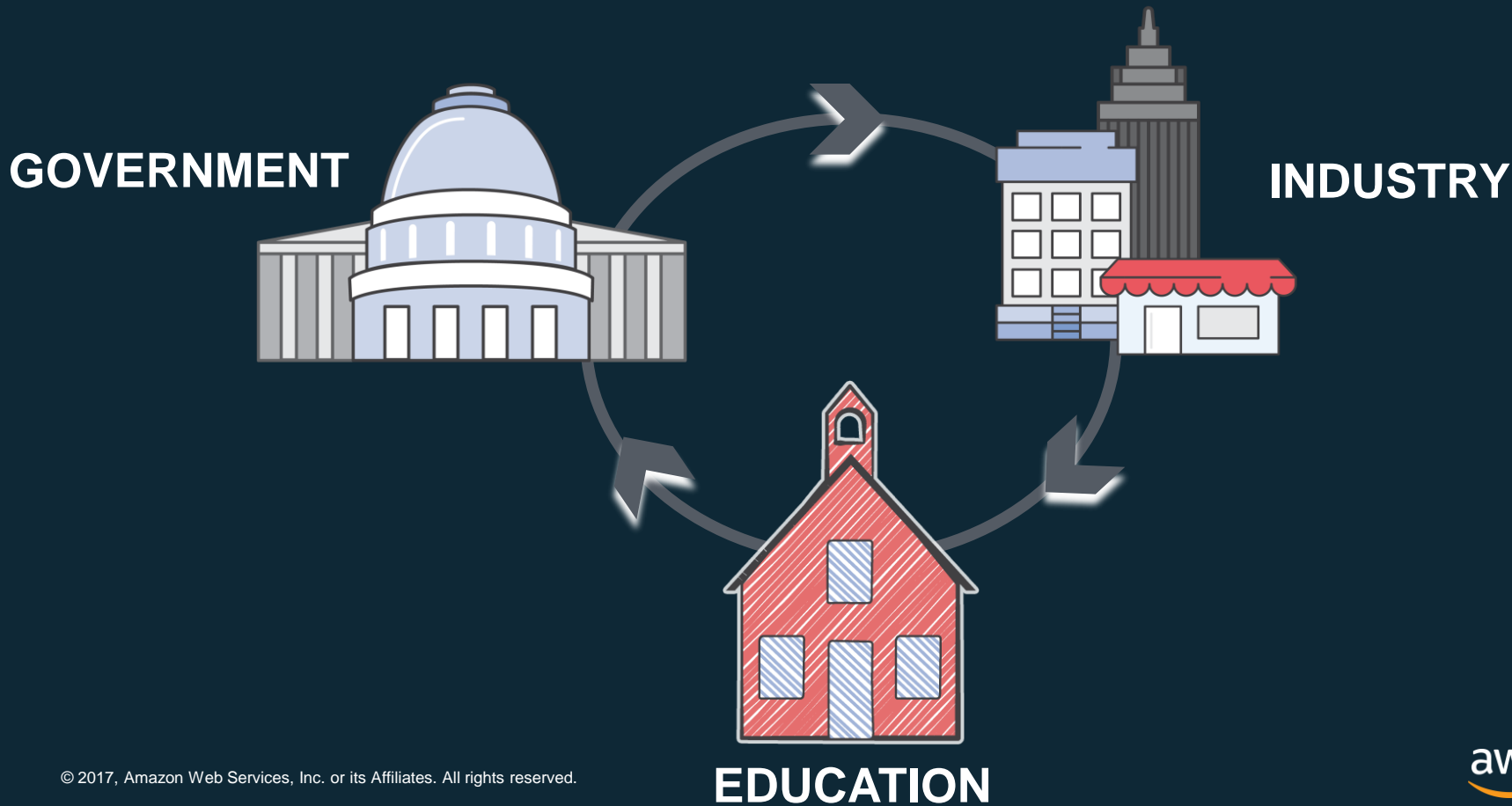
ERICA PETERSON

FROM 89.3 WFPL



Theory of Change

All sectors must collaborate on systemic change



What is AWS doing to address the skills gap?



Teaching Tomorrow's Cloud Workforce Today

AWS Educate value proposition and goals



Grants for free
access to AWS



Open course
content



Professional
development for
educators



Communities of
collaboration




- Positively impact hundreds thousands of students
- Curriculum change
- Student entrepreneurship
- Growth in credentialing
- Accelerate hiring pipeline
- Jobs





aws educate

Portfolio Career Pathways Learn Badges Jobs AWS Account Logout

 **Grace Student**

Consecutive Days: **1** Skills Completed: **3** Badges Earned: **0**

Career Path: **Hadoop Developer**

Your Progress: 64%


[CONTINUE LEARNING](#)

Career Path: **Distributed Systems Engineer**

Your Progress: 41%

[CONTINUE LEARNING](#)

Your Journey to a Cloud Career with AWS Educate




Suggested Jobs


2017 New Grad Software Development Engineer
Amazon
[more about this opportunity](#)


Associate Software Engineer, IT
Salesforce
[more about this opportunity](#)


Senior Data Engineer
Udacity
[more about this opportunity](#)


Software Engineer in Test
Instructure
[more about this opportunity](#)


[Want to see more?](#) 

 Portfolio

 Career Pathways

 Learn

 Badges

 Jobs

[FAQs](#) | [AWS Support Forum](#) | [Terms and Conditions](#)

(c)2016, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Choose Your Career Path

27 careers – 30+ hours of content each – access to labs and AWS Technical Essentials

Mass educational institutional demand

1000+
Educational
Institutions

Top 10
Global Computer
Science &
Information
Systems Institutions

QS World University Rankings by Subject 2016 - Computer
Science & Information Systems

Sampling of global member schools

Carnegie Mellon University

ASU Arizona State University

UCL

서울대학교
SEOUL NATIONAL UNIVERSITY

KYUSHU UNIVERSITY

UNIVERSITY OF CANBERRA

Australian National University

UNIVERSITY of WASHINGTON

TUM
TECHNISCHE UNIVERSITÄT MÜNCHEN

UFM
UNIVERSIDAD FRANCISCO MARROQUIN
VERITAS • LIBERTAS • JUSTITIA

MYONGJI UNIVERSITY
명지대학교

Indian Institute of Technology Gandhinagar

Gujarat Technical University

RMIT UNIVERSITY

V.A.S.T

CORNELL NYC TECH

UNIVERSITY OF WEST LONDON
The Career University

Antecap

HANGONG GLOBAL UNIVERSITY

INHA UNIVERSITY

ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH

ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH

広島大学

Miami Dade College

42 CODING ACADEMY

SMU
SINGAPORE MANAGEMENT UNIVERSITY

SOGANG UNIVERSITY

HANYANG UNIVERSITY

ĐẠI HỌC CAN THO

전북대학교
CHONBUK NATIONAL UNIVERSITY

THE UNIVERSITY OF WESTERN AUSTRALIA

LA HITECH

SUPINFO
International University

National College of Ireland

SINGAPORE INSTITUTE OF TECHNOLOGY

NYP
NANYANG POLYTECHNIC

HCMUTE

ĐẠI HỌC BÁCH KHOA
NANG

CAU UNIVERSITY

ICT ACADEMY
Innovate... Collaborate... Educate...

aws

Public private partnerships in action



Kentucky Cloud Career Pathways Collaboration Will Prepare Students for Technology-Based Careers

07/13/17

Public-private collaboration with Amazon Web Services, Inc. and third parties to help drive a cloud-enabled workforce and economy

FRANKFORT, Ky. – The Kentucky Education and Workforce Development Cabinet announced today a new collaboration among state, education, non-profit, and private sector parties aimed at creating Kentucky Cloud Career Pathways, which are specific courses and educational opportunities designed to prepare students with the skill-sets needed to address the massive growth and job opportunities in cloud, cyber security, and computer science fields.

"The technological transformation occurring globally is changing the way we live and work at an unprecedented pace," said Gov. Matt Bevin. "Kentucky must be a leader in preparing our students and existing workforce to capitalize on the many job opportunities that innovation in technology is creating."

Gov. John Kasich celebrates Amazon jobs ahead of State of the State address

17

Updated on April 3, 2017 at 5:52 PM, Posted on April 3, 2017 at 5:50 PM



The
Central
Ohio
Compact

Central Ohio Compact

Institutional alignment to address the need

Yonsei University selects AWS to prepare itself and its students for the 4th Industrial Revolution

- Yonsei University migrates all its websites to AWS Cloud for the first time in the higher education community in Korea
- AWS Educate enables Yonsei University to accelerate students' cloud computing capabilities with cutting edge technology

Seoul, Korea – September 8, 2017 – Yonsei University, one of the most prestigious universities in Korea, announced today that it will migrate its IT infrastructure to the AWS Cloud to prepare itself and its students for the 4th Industrial Revolution.

The 4th Industrial Revolution is a term indicating technological trends in which such state-of-the-art digital technologies as IoT, big data, and cloud computing are expected to create new forms of life and business. Among them, cloud technology is considered as a critical enabler of the new revolution across industries including education. As part of an effort to realize the vision of becoming the leading university in highly advanced learning environments, Yonsei University has selected AWS as its cloud service provider.

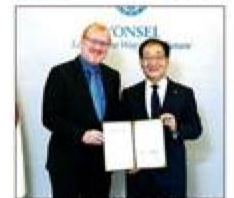
On September 8, Yonsei University and Amazon Web Services Korea LLC held a conference, entitled “Cultivating Talent and Innovating IT Environment in the 4th Industrial Revolution Era” at Yonsei University to discuss ways of introducing the AWS Cloud and the AWS Educate program, and setting up a curriculum for the future. The conference was attended by several executives from the university and AWS including Yonghak Kim, Ph.D., President of Yonsei University; Jeongwoo Lee, the head of Yonsei University Library; Peter Moore, Asia Pacific Managing Director of Global Public Sector, Amazon Web Services Singapore Private Limited; and Jeongwon Yoon, Country Leader, Worldwide Public Sector Korea, Amazon Web Services Korea LLC.

According to the discussions, Yonsei University plans to migrate all the websites for the university and its internal institutions to the AWS Cloud. At the same time, it expects to introduce the AWS Educate program as part of its teaching curriculum on AWS Solution Architect for about 2,000 students. Additionally, the university is considering introducing the Amazon WorkSpaces service and the video management service in its computing training facilities. The AWS Educate program is expected to support the university's mission in accelerating students' capabilities on the highly sought-after cloud computing skills, helping them to acquire the expertise that are increasingly relevant for their future employment.

The Financial News

파이낸셜뉴스

2017년 09월 08일
12면 (IT, 과학)



퓨터부터 AWS 역사대명항 공공 총
관(원칙)과 관용학 연세대 총장이 김당
회에서 협약서를 들고 포즈를 취하고
있다.

연세대 교내 IT 인프라 AWS 클라우드로 전환

연세대대학교가 교내 정보통신 환경을 아마존웹서비스(AWS)의 클라우드로 전환한다. AWS는 연세대 학교가 4차 산업혁명 주도형 인재 양성과 글로벌 명문 대학으로의 도약 기반을 마련하기 위해 교내 정보통신 환경을 AWS 클라우드로 전환한다고 8일 밝혔다.

연세대대학교는 4차 산업혁명 시대에 가장 진보된 교육환경을 제공하기는 선도적인 대학이 마땅하다는 비

Changing youth and workforce trajectory



AWS Educate is central to Amazon's education and workforce development strategy, but it will only reach our most profound goals through collaboration and thinking big on behalf of the future workforce. We hope to play a big role in that effort.

Thank You!