EAB

Industry Futures 2021: Technological Advancements of the Digital Revolution

How Automation is Changing the Corporate Landscape and What Institutions Can Do to Prepare Their Students for Industry 4.0

Professional and Adult Education Forum

Zoom Poll:

Are Robots Taking Our Jobs?

1. Yes, and we should be worried
2. Yes, and that's a good thing
3. Maybe, seems like robotic labor could eclipse human labor soon
4. No, human labor continues to outpace robotic labor

You Are Here: The Digital Revolution

All Industries Are on the Path to Automation, and Some Are Pushing Ahead

Eras of the Digital Revolution

3.0

Transformation

- Automation processes developed but not implemented
- Data collected but still analyzed manually
- Some automation processes implemented, still require human involvement

Example Industry

Higher Education

4.0

Automation

- Automation the norm across processes
- Data collected and initially analyzed by AI; human checks
- AI guides processes with occasional improvements; little human involvement

Example Industry

Food Preparation

5.0

Reintegration

- Processes fully automated; new processes decided by AI
- Data collected, analyzed, and used in real time by AI
- AI predicts deficiencies it cannot solve and recruits human intervention

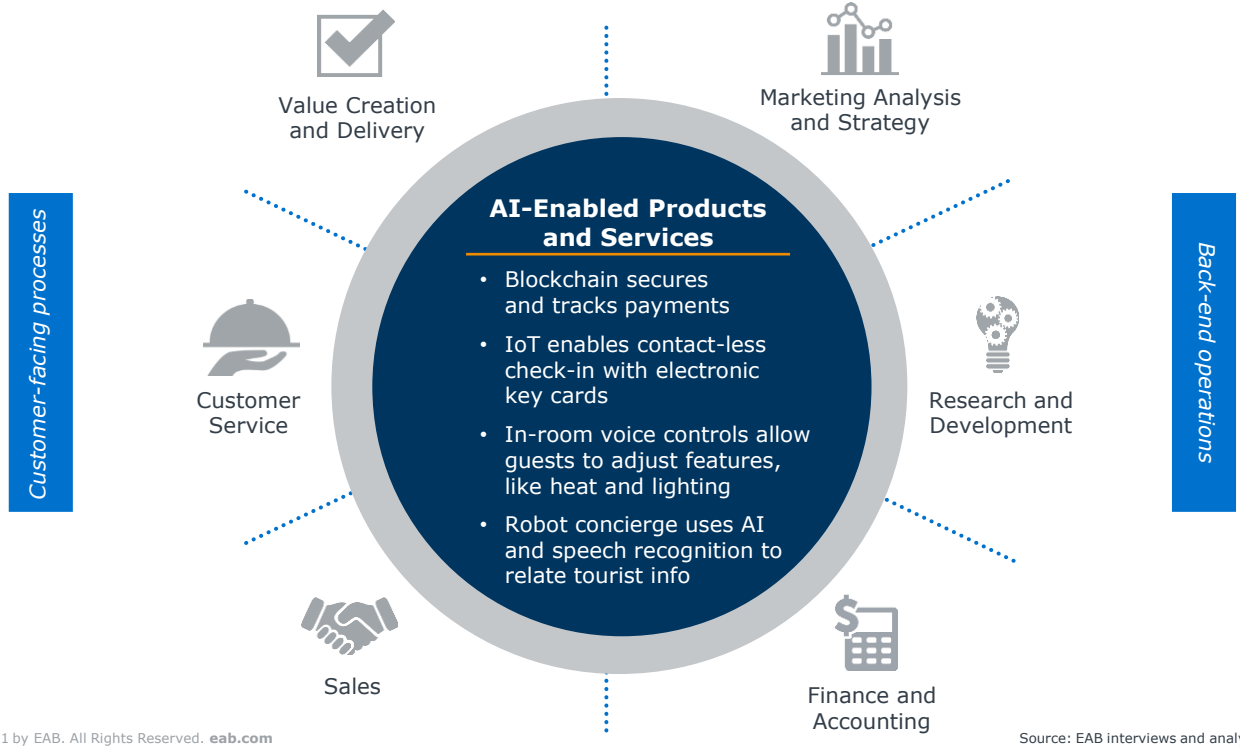
Example Industry

Big Agriculture

Source: EAB interviews and analysis.

Step Into the Lobby of the Future

Hotels Moving from Concierge to Digitized Self-Service



Source: EAB interviews and analysis.

The Ongoing Sparks of Revolution

Unpacking the Pressures on Industry to Adopt More Advanced Technologies

Demographic Shifts

Baby Boomer Retirement

Millennials In Charge

Flat Labor Force Participation

Business Pressures

Increased Customer Demand

Lagging Supply Chains

Greater Complication

Available Tech Tools

Data-Powered Everything

Turnkey Solutions (Sort Of)

Accessibility of Automation

Sources: The Demographic Drought, Emsi; EAB interviews and analysis.

The Revolution at Home

What Are the Risks of Not Responding to Evolving Employer Demands?

- Enrollment Declines
- Diminished Reputation
- Low Student Placement
- Loss of Partnerships

Continuing Ed Leaders Need to Address Age-Old Questions with a New Urgency

Program Longevity

- "Will the digital skills this program teaches be relevant in five years?"

Student Success

- "What types of new jobs will graduates of this program secure?"

Institutional Capacity

- "Who is going to teach these new emerging technology courses?"

Source: EAB interviews and analysis.

Noisy Tech Makes It Hard to Hear Each Other

Conversations About New Skills Get Lost in Translation

Industry Dissatisfied with Current Higher Ed Programming

"Universities are not preparing graduates with the right skills to meet our needs."

- Industry leaders give feedback to multiple stakeholders at the university, including faculty and continuing ed staff
- Articulated needs are often uncomprehensive and vague, like increased creativity or resilience
- When industry can express concrete needs, they serve immediate and fragmented interests

Industry Demands

Higher Ed Confused by Unclear Industry Demands

"We created a new program based on employer feedback, but no one enrolled."

- Higher ed often struggles to integrate these layered relationships with employers into strategic programming
- Attempts to be future-oriented thwarted by the lack of direction from industry partners
- In response to industry demands, institutions launch new programs to serve short-term and disjointed needs

Institutional Response

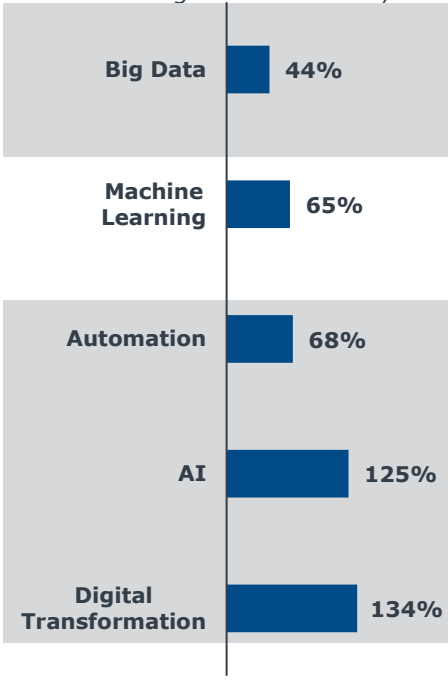
Source: EAB interviews and analysis.

A Skills Gap for the Modern Era

What Employers Need and What Universities Have Struggled to Provide

Employers' Needs are Changing...

Demand Change for Hard Skills, 2017-2021



...but Offerings Not Keeping Pace.

Higher Ed Program Offerings for Hard Skills

Widely Available

Even initial skeptics are now adding programming in big data and data analytics

Somewhat Available

While specialized, machine learning is becoming more available at different levels

Not Widely Available

Programs that embed these skills are only offered by elite universities with highly specialized computer science and engineering programs

Sources: Emsi Burning Glass; EAB interviews and analysis.

Developing Digital Revolution-Ready Grads

Industry 5.0 Requires Better Integration of Hard and Human Skills

The T-shaped Professional…

Universal competencies in leadership, empathy, cross-cultural experience

Mastery of a skill, process, product, or body of knowledge

…is Missing Cross-discipline Skills

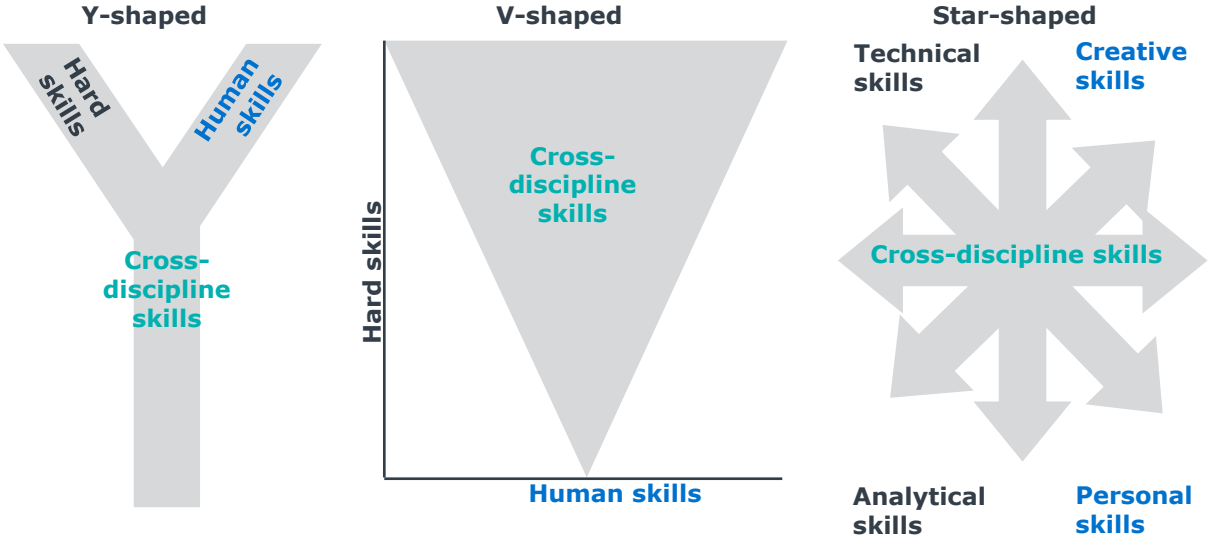
Cross-discipline skills:

- Capture skill mastery and areas of expertise
- Can grow in more than two directions
- Accounts for change in skill requirements over a career

Source: EAB interviews and analysis.

Developing Digital Revolution-Ready Grads (cont.)

If Not T-Shaped, Then What Shaped?



Sources: V-shape adapted from *Versatilist V-shaped Professionals, Peter Cripps*; Star-shape adapted from *Becoming a Star-Shaped Professional, Kris Coverdale*; EAB interviews and analysis.

Rising Floors, Shifting Ceilings

Technological Advances Are Throwing Programming Levels into Disarray

What Is Changing

- Increasing number of hard skills in job postings
- Growing technical skill requirements for jobs

- Increasing demand for leadership in non-management jobs
- Growing demand for communication skills around technical areas

- Increasing demand for technical knowledge and management ability
- Growing number of human skills in job descriptions

What It Means for Institutions

More Hard Skills

Pre-baccalaureate programs need to balance hard skill certificate offerings with cross-disciplinary skill development.

More Human Skills

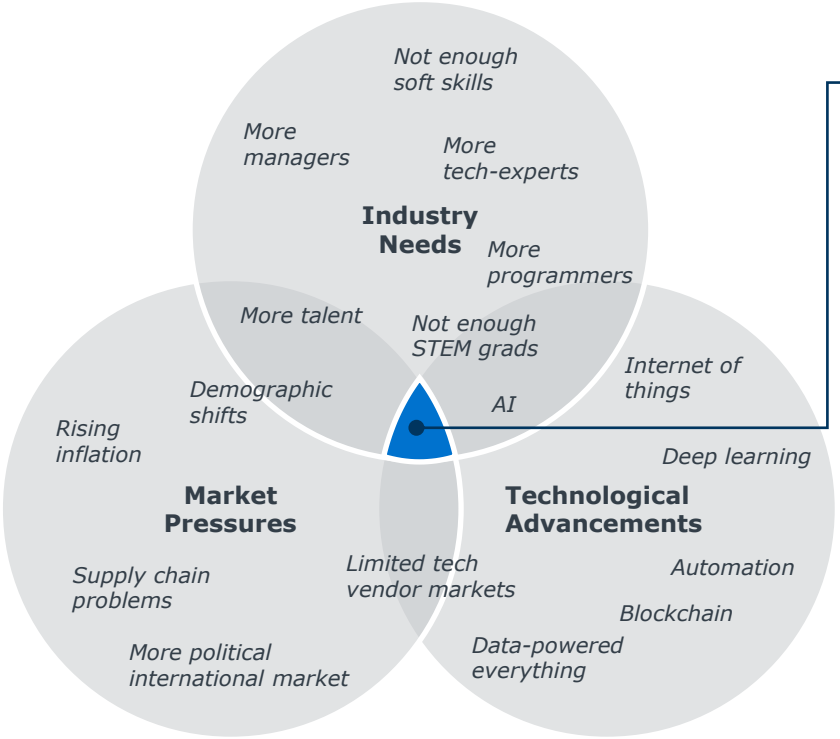
Bachelor's programs must incorporate more communication, team-building, and problem-solving skills into their curricula.

More Cross-Discipline Skills

Master's degree programs must integrate hard skill specialization and human skills to make students competitive for management roles that require greater technical knowledge and oversight.

Sources: Emsi Burning Glass; EAB interviews and analysis.

Finding Focus in an Era of Disruption



The Digital Revolution Balancing Act

Fusion of hard, human, and cross-disciplinary skills

Hard skills to understand, create, and adjust advances in technology.

Human skills to support technology integration and subsequent change management.

Cross-disciplinary skills to succeed in any industry experimenting with technological advancements.

Source: EAB interviews and analysis.

Our Agenda for Today

Unpacking the Skillsets that Underly the Industry 5.0 Jobscape

Key Considerations	The Big Data Skillset	The Tech Change Management Skillset
What belongs in this skillset?		
What courses offer these skills?		
What is the right means of offering these programs?		
What co/extra-curricular activities imbue these skills?		
How can industry partnerships further hone offerings?		
How do institutions assess programs' longevity?		

Source: EAB interviews and analysis.

The Big Data Skillset

Introducing the Big Data Professional

Developing Industry 5.0 Big Data Skillset

0101
1100
1111

The modern Big Data professional is more than just a data manager—they are increasingly responsible for more sophisticated analyses and applying AI to solve business problems.

The Emerging Skillset

Average Percent Growth, 2018-2021

Data Infrastructure	141%
Artificial Intelligence	135%
Data Visualization	110%
Data Transformation	77%

The Jobs of Tomorrow

Data Detective

Algorithm Bias Auditor

Robot Programmer

Sources: Emsi Burning Glass; EAB interviews and analysis.

Breaking Down the Big Data Skillset

Design Programs Around the Fundamentals of Today's Data Needs

Data Analytics Essentials

- Analytic Applications
- Data Manipulation
- Predictive Analytics

Emerging Tech Knowledge

- Artificial Intelligence
- Internet of Things
- Machine Learning

Applied Business Strategy

- Digital Transformation
- Strategic Roadmaps
- Technology Solutions

Rockhurst University

Analytics and Insights Graduate Certificate

Northwestern School of Professional Studies

Predictive Analytics Master's

Dakota State University

AI in Organizations Bachelor's

Rutgers The State University of New Jersey

Mini-MBA in AI

Missouri S&T

Big Data Management & Analytics Certificate

Brandeis University

Strategic Analytics Master's

Source: Emsi Burning Glass; EAB interviews and analysis.

Rightsizing Data Program Offerings

Emerging Tech Topics Integral to Programs Across the Portfolio

Courses

- Emphasizes emerging tech skills while using business cases to apply knowledge
- Course options and difficulty differ based on program audience's experience

Modality

- Data courses and credentials can easily be offered in online and non-credit formats
- Emerging tech programs typically offered in short-format certificates or specializations

Degree Level

- Data courses can easily stack into certificates, bachelor's degrees, and professional ed
- Opportunities to integrate data skills into all program subjects and degree levels

Ownership

- Executive education, non-credit options, and certificates remain traditional domain of continuing education units
- Collaborate with schools of business and technology

Syracuse University

Online BS in Applied Data and Predictive Analytics

NC STATE UNIVERSITY

Agricultural Data Science Graduate Certificate

Clarkson

Online MS in Healthcare Data Analytics

Listen First, Advise Second

Helping Industry Partners Narrow in On Their Specific Data Talent Needs

✖ What kind of data talent do you need?

✔ What are you working on?

- Understanding a company's various projects and goals provides better insight into their data needs than asking them to articulate specific needs

✖ What data tools are you using?

✔ What gaps exist in your data talent?

- Discussing specific projects allows companies to articulate what needs are not met by current staff
- Considering broader goals encourages companies to identify inefficiencies in current processes

✖ When do you need to fill those roles?

✔ How much of this need is short vs long term?

- Many short-term, small-scale projects are good internship/co-op opportunities
- Longer term, larger projects require dedicated data professionals at various levels of expertise

"These are the types of data professionals you need"

Ultimately, universities should be recommending specific types of data professionals and skillsets to companies rather than the other way around.

Source: EAB interviews and analysis.

Enhance Coursework with Real-World Applications

Students Develop Human Skills In and Outside the Classroom

Curricular

- Applied projects and presentations
- Opportunities to enhance value-add for corporate partners

Co-Curricular

- Capstone projects and practicums
- Allows students to unpack employer issues so project is connected to work experience

Extra-Curricular

- Internships, competitions, and coaching programs
- Empowers students to apply instruction and demonstrate critical thinking skills

Drexel University

Master of Science in AI & Machine Learning

- Integrates applied projects and presentations
- Apply theory learned in class to machine and deep learning problems

Duke

Master of Engineering in AI for Product Innovation

- Work with industry partners to solve real-world challenges in capstone course
- Present solutions to external panels

Oregon State University

Bachelor of Science in Biological Data Sciences

- Partners with USDA to offer an optional Big Data Internship
- Learn how advances in AI technologies impact agricultural work

Source: EAB interviews and analysis.

Adapt Today's Programs to Meet Tomorrow's Needs

Three Ways to Keep Up-To-Date with Data Trends

1

Adjust Existing Offerings

- Add emerging tech courses into existing data analytics and computer science programs
- Develop emerging tech specializations in business and leadership degrees

UNIVERSITY OF St.Thomas

The University of St. Thomas redesigned their Business Analytics programs to include more emerging tech electives, like machine learning, and an applied capstone course.

Source: EAB interviews and analysis.

Adapt Today's Programs to Meet Tomorrow's Needs

Three Ways to Keep Up-To-Date with Data Trends

1 Adjust Existing Offerings

- Add emerging tech courses into existing data analytics and computer science programs
- Develop emerging tech specializations in business and leadership degrees

The University of St. Thomas redesigned their Business Analytics programs to include more emerging tech electives, like machine learning, and an applied capstone course.

2 Build a New Program

- Offer data programs ranging from executive education primers to specialized master's degrees
- Create new programs based on faculty topics of expertise

The University of Florida launched a new AI & Data Analytics Certificate in Tourism, Hospitality, and Event Management in response to the pandemic.

Source: EAB interviews and analysis.

Adapt Today's Programs to Meet Tomorrow's Needs

Three Ways to Keep Up-To-Date with Data Trends

1 Adjust Existing Offerings

- Add emerging tech courses into existing data analytics and computer science programs
- Develop emerging tech specializations in business and leadership degrees

2 Build a New Program

- Offer data programs ranging from executive education primers to specialized master's degrees
- Create new programs based on faculty topics of expertise

3 Discontinue Program

- Retain foundational data analysis skills and techniques as programming essentials
- Modify or eliminate emerging tech courses as digital technologies continue to adapt

UNIVERSITY OF St. Thomas

The University of St. Thomas redesigned their Business Analytics programs to include more emerging tech electives, like machine learning, and an applied capstone course.

UF UNIVERSITY of FLORIDA

The University of Florida launched a new AI & Data Analytics Certificate in Tourism, Hospitality, and Event Management in response to the pandemic.

LSU

LSU developed an Emerging Technology specialization within their MBA degree where courses can be easily exchanged as emerging technologies shift.

Source: EAB interviews and analysis.

The Tech Change Management Skillset

2

Introducing the Tech Change Management Skillset

Developing Industry 5.0 Change Management Professionals

The modern Change Management professional is more versatile than ever—they must understand technological ecosystems, automation opportunities, and human-centric planning.

The Emerging Skillset

Average Percent Growth, 2018-2021

Robotic Process Automation	150%
Digital Transformation	143%
Growth Mindedness	199%
Technical Acumen	108%

The Jobs of Tomorrow

Human-Machine Team Manager

Automation Integration Consultant

Robot Wrangler

Sources: Emsi Burning Glass; EAB interviews and analysis.

The Sweet Spot for the Technology Change Skillset

Combine Hard and Human Skills to Create Well-Rounded Managers

Hard Skills	Human Skills
• Technology solutions • Digital technology and transformation • Robotic process automation • Artificial intelligence • Data visualization • Data-driven decision making	• Change agility • Adaptive leadership • Growth mindedness • Complex problem solving • Innovation • Critical thinking • Strategic prioritization • Integration

Areas of Expertise

Business Analytics
Technical understanding of databases, statistics, machine learning applications and how to fit into business models

Product Management
Deep knowledge on programming, agile, experimental methodologies with management expertise

Technology Consulting
Advanced understanding of business strategy and core technology applications skills to coordinate process improvements

The Curricular Gamut of Change Management Programming

Duke University's Executive Education's Data-Driven Decision Making Course

University of Pittsburgh's Micro-Credential in Digital Innovation

Northeastern University's Master of Science in Innovation

Sources: Emsi Burning Glass; EAB interviews and analysis.

Rightsizing Change Management Program Offerings

Identify the Right Combination of Options to Create a Successful Program

Courses

- Basics of data analytics and applications with foundational business change management
- Includes: data-driven decision making, digital transformation strategy, platform strategy for business

Modality

- Courses, Micro-Master's, Master's Degrees offered for credit
- Micro-credentials and certificates either non- or for- credit

Degree Level

- Mostly at the master's level, for students with industry experience
- Bachelor students primed with courses in relevant technical applications

Ownership

- Opportunities for collaboration between schools of business, engineering, and computer science
- Executive education incubates courses and creates pathways into master's programs

Collaboration and Pathways in Action

University of Ottawa's MS in Digital Transformation and Innovation is a collaboration between schools of management, engineering, and the arts.

Boston University's MicroMaster's in Digital Leadership waives 25% of degree requirements for Master's of Science in Digital Innovation program.

Source: EAB interviews and analysis.

Part Tech Evangelist, Part Management Consultant

Industry Needs a Special Combination of Vision and Implementation Skills

In-House Roles

What Industry Needs

- Build (and maintain) company identity through tech adoption
- Staggered, linear tech integration and prioritization
- Consistent stakeholder communication and buy-in

NETFLIX

Netflix is notorious for its continuous adaptation of new technologies and formats for delivering its programming. They accomplish this through hiring professionals like "Software QA Managers" and "Project Management Specialists" in house to guide tech integration and change management.

External Consultants

What Consulting Firms Need

- Easily connect existing tech solutions to corporate problems
- Fast-paced, on-budget integration solutions
- Executive process buy-in and expectation setting

accenture

Accenture is one of the best-known technology change management consultancies, frequently employed by small and large companies to integrate new enterprise solutions. They hire professionals with a strong balance of tech knowledge and communications skills.

Sources: Netflix Change Management Case Study; Accenture Strategy and Consulting services; Emsi Burning Glass; EAB interviews and analysis.

Enhance Coursework with Real-World Applications

Students Develop Human Skills In and Outside the Classroom

Curricular

Opportunities to enhance value-add for corporate partners and student experience

GMU's IT Strategy and Digital Transformation Certificate culminates in an applied project course. Teams of students work with a local or national company to develop a digital transformation strategy and present recommendations to faculty and business community. Completed after students take courses in Leadership and Change Management, Competitive Strategy in Tech Industries, among others.

Co-Curricular

Allows students to unpack employer issues so project is connected to work experience

ECU's MS in Technology Management offers a Practicum in Industrial Technology. Students can conduct independent study, partnering with their employer to solve a real-world problem. The project must be approved by a faculty member. Students write a report on the experience and present a seminar. Students can also choose to write a thesis or pass a comprehensive exam.

Extra-Curricular

Empowers students to apply instruction and demonstrate critical thinking skills

University of Pennsylvania's Executive Education Advanced Management Program pairs each student with an executive coach to create goals and make connections between curriculum and work. Sessions begin before the program and extend beyond completion, to help graduates transition back to work and implement learning. Students also participate in small group coaching sessions.

Source: EAB interviews and analysis.

Adapt Today's Programs to Meet Tomorrow's Needs

Three Ways to Keep Up-To-Date with Change Management Trends

1

Adjust Existing Offerings

- Add innovative change management courses to MBA, MEng, Computer Science programs
- Create specialization tracks for enrolled students

BOSTON UNIVERSITY

BU's MBA + MS in Digital Technology program has three paths: product management, analytics, or internal and external consulting.

Source: EAB interviews and analysis.

Adapt Today's Programs to Meet Tomorrow's Needs

Three Ways to Keep Up-To-Date with Change Management Trends

1 Adjust Existing Offerings

- Add innovative change management courses to MBA, MEng, Computer Science programs
- Create specialization tracks for enrolled students

BOSTON UNIVERSITY

BU's MBA + MS in Digital Technology program has three paths: product management, analytics, or internal and external consulting.

2 Build a New Program

- Develop an innovative, non-traditional program
- Build a new master's program with meld of foundational change management, technology applications, and analytical skills

THE UNIVERSITY OF UTAH

Utah's Certificate in Digital Innovation is based on an apprenticeship model and courses are a combination of online and in residency.

Source: EAB interviews and analysis.

Adapt Today's Programs to Meet Tomorrow's Needs

Three Ways to Keep Up-To-Date with Change Management Trends

1 Adjust Existing Offerings

- Add innovative change management courses to MBA, MEng, Computer Science programs
- Create specialization tracks for enrolled students

2 Build a New Program

- Develop an innovative, non-traditional program
- Build a new master's program with meld of foundational change management, technology applications, and analytical skills

3 Discontinue Program

- Continue foundational management courses
- Adjust technical and analytical programming as technology advances
- Change specialization tracks to match innovative technology

BOSTON UNIVERSITY

BU's MBA + MS in Digital Technology program has three paths: product management, analytics, or internal and external consulting.

THE UNIVERSITY OF UTAH

Utah's Certificate in Digital Innovation is based on an apprenticeship model and courses are a combination of online and in residency.

Georgia Institute of Technology

Georgia Tech's MBA has a Leading Digital Transformation immersive track. Students choose two electives, take a technology strategy course, complete a practicum.

Source: EAB interviews and analysis.

Breakout Room Activity

Discussion

- We will place you in a breakout room with a few other attendees and a facilitator from EAB
- Introduce yourselves: your name, institution, and title
- Then discuss as a group a few of these questions:
  - How do you determine which courses or programs are the "right bets"/those that will stay relevant and become a worthy investment?
  - How can you apply this knowledge to the two skill sets?
  - What KPIs indicate whether program shifts are successful?
  - How does your office stay in tune with disruptive changes to industry and employer demand that could affect your programming?
- You will have 15 minutes in breakout rooms

Our Upcoming Meetings

Industry Futures 2021: The Next Era of Professional Programming

The Digital Revolution

How are advances in big data, machine learning, AI, and automation impacting various industry sectors?

Meeting series:

- ~~*October 14th, 2pm EST*~~
- *October 19th, 1pm EST*
- *October 21st, 10am EST*

Smart Manufacturing

What skills are required to work in today's highly automated, data-driven manufacturing factories?

Meeting series:

- *October 25th, 2pm EST*
- *October 28th, 3pm EST*
- *November 2nd, 11am EST*

Tech-Enabled Financial Services

How can financial and technology professionals blend their skills to meet the emerging fintech needs?

Meeting series:

- *November 10th, 1pm EST*
- *November 15th, 2pm EST*
- *November 18th, 10am EST*

Brief Post-Session Poll

Thank you for your participation today.
We appreciate your feedback on this material.