A HYBRID EDUCATION FOR A HYBRID JOB MARKET

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BURNING GLASS TECHNOLOGIES

SXSW.edu 2016
OLD REALITIES ARE CRUMBLING: LATERAL CAREER PATHS ARE NO LONGER THE NORM

The traditional view is that jobs evolve in a straight line...

...and skills are picked up naturally along the way
NEW REALITY: A HYBRID JOB ECONOMY

But recently we’re seeing more and more jobs become hybrids of two or more skill sets from different fields.

PROGRAMMING

MARKETING

UI/UX

DESIGN

Mobile App Developer

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Hybrid Job Growth

A key trend is jobs that combine skills from different fields, such as technology and marketing, or product management and data analytics.

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Job Count Last 12 Months</th>
<th>Change Since 2011</th>
<th>Avg. Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Development and Design</td>
<td>67,250</td>
<td>3%</td>
<td>$87,217</td>
</tr>
<tr>
<td>Digital Marketing &amp; Marketing Automation</td>
<td>45,991</td>
<td>145%</td>
<td>$76,783</td>
</tr>
<tr>
<td>Project Management</td>
<td>40,752</td>
<td>7%</td>
<td>$106,471</td>
</tr>
<tr>
<td>User Experience / User Interface (UI/UX)</td>
<td>29,825</td>
<td>15%</td>
<td>$99,177</td>
</tr>
<tr>
<td>Mobile Development</td>
<td>41,032</td>
<td>135%</td>
<td>$111,380</td>
</tr>
<tr>
<td>Data Analytics</td>
<td>41,000</td>
<td>372%</td>
<td>$105,540</td>
</tr>
</tbody>
</table>

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HYBRID JOB GROWTH OUTPACES TRADITIONAL FIELDS

<table>
<thead>
<tr>
<th>ALL HYBRID JOBS</th>
<th>ALL IT JOBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOB COUNT</td>
<td>JOB COUNT</td>
</tr>
<tr>
<td>265,850</td>
<td>1,975,788</td>
</tr>
<tr>
<td>LAST 12 MONTHS</td>
<td>LAST 12 MONTHS</td>
</tr>
<tr>
<td>53%</td>
<td>7%</td>
</tr>
<tr>
<td>CHANGE SINCE 2011</td>
<td>CHANGE SINCE 2011</td>
</tr>
<tr>
<td>$96,206</td>
<td>$86,475</td>
</tr>
<tr>
<td>AVG. SALARY</td>
<td>AVG. SALARY</td>
</tr>
</tbody>
</table>

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ATTACK OF THE JOB-KILLING ROBOTS

14% DECLINE IN SHARE OF MIDDLE SKILL JOBS

The “commodity jobs” that require repetitive labor aren’t becoming hybrids—they’re being automated

32% OF ALL JOB ADS REQUEST A COGNITIVE SKILL

The jobs that require creativity and judgment can’t be automated, but increasingly they demand multiple skill sets

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ONE REASON: TECH IS MORE DEMOCRATIC

Technology that used to only belong to experts and specialists is now broadly available. Tech skills are becoming integral to a wide set of jobs. This drives a greater need for "soft skills," like judgment, to bridge knowledge sets and domains.
OUR EXISTING SYSTEM CAN’T KEEP UP WITH HYBRID JOBS

The traditional model—early training and a career that evolves in a straight line—doesn’t work.

Getting the skills mix right is critical—and difficult.

Evolution is slow. Synthesis is fast.
Five years ago Data Analytics barely existed as an occupation. Few students would have known about this career, and few schools were planning for it.

Even if they had, the occupation has changed a lot, moving from quantitative work to business analysis.
Five years ago Geology majors had great job prospects in the oil and gas industry.

Students going into college then didn’t anticipate oil falling to $30 a barrel.
ON THE ONE HAND
JOBS ARE CHANGING TOO FAST EVEN FOR TECHNICAL PROGRAMS TO KEEP PACE

Example: Jobs in Data Analytics

- **Hadoop**: +808%
- **Hive**: +1,955%
- **Tableau**: +2,574%

**Fastest growing skills in Data Analytics jobs**

- **Job Count**: 41,000
- **Change Since 2011**: 372%
- **Avg. Salary**: $105,543
AND EMPLOYERS STRUGGLE AS LEAST AS MUCH TO FIND THE SOFT SKILLS THAT ARE THE HALLMARK OF TRADITIONAL LIBERAL ARTS
THE TROUBLE IS THAT EMPLOYERS NEED THE FULL PACKAGE

Top Skills Employers Demand in Jobs Emphasizing Creativity

PROGRAMING & SOFTWARE DEVELOPMENT SKILLS
- SQL
- JavaScript, JAVA
- Software Engineering
- Web Site Development
- Technical Writing & Editing

MARKETING & SALES SKILLS
- Social Media
- Sales
- Marketing
- Merchandising
- Market Strategy

BUSINESS SKILLS
- Business Development
- Accounting
- Business Process
- Store Management
- E-Commerce

PRODUCT DEVELOPMENT & MANAGEMENT SKILLS
- Concept Development
- Product Development
- Product Management
- Product Marketing
- Product Design

DESIGN SKILLS
- Adobe Photoshop
- Graphic Design
- Adobe Acrobat
- Web Site Design
- InDesign

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THE CHALLENGE TO TRADITIONAL HIGHER ED

In a hybrid economy, workers need the foundational skills to move across fields and to acquire the specific technical skills on the fly.

We need to build an education and training infrastructure that allows that.

This opens up opportunities for a range of emerging players – but also traditional ones.

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AN OPPORTUNITY FOR NONTRADITIONAL PLAYERS

BOOT CAMPS
General Assembly, TreeHouse, etc.

ONLINE PROVIDERS
Pluralsight, Coursera, edX, Khan Academy, Udemy

CERTIFICATION ISSUERS & PLATFORMS
compTIA, Cisco, Microsoft, Salesforce

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CASE STUDY
GENERAL ASSEMBLY: TARGETED PROGRAMS AIMED AT REAL-TIME TRANSITION TO HIGH DEMAND OPPORTUNITIES

Data Scientist
Data Architect
Database Administrator
Data Warehousing Specialist
Data / Data Mining Analyst

Entry Level Database / Programming Roles

- Data Science Immersive
- SQL Bootcamp
- Data Analytics
- Python for Data Science

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AN OPPORTUNITY
LEVERAGING RECOGNIZED STRENGTHS TO BUILD CERTIFICATE PROGRAMS AIMED AT CAREER TRANSITIONS

Example: Preparing Web Designers to Move Up to UI/UX Roles:

USER INTERFACE/EXPERIENCE SKILLS
- Information Architecture
- Usability Testing
- Web Application Development
- Mobile Application Development
- Interface Design
- GUI Design

DEVELOPMENT FRAMEWORK
- MS C#
- .NET
- PHP
- JSON

WEB DEVELOPMENT LANGUAGE AND CODING
- Agile
- Scrum

WEB DEVELOPER

NEW SKILLS ABOVE

UI/UX SPECIALIST

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AN OPPORTUNITY FOR CERTIFICATION & BADGE ISSUERS

DOOR OPENERS
ASW (Welding)
A+ (help desk)
+8% salary premium

CAREER ADVANCERS
CISSP
+10% salary premium
PMP
+21% salary premium

BADGES
Android
Hadoop
+22% salary premium
ACQUIRING CERTIFICATIONS CAN VALIDATE SKILLS: HUMAN RESOURCES

PAYROLL
- Fundamental Payroll Certifications
- Certified Payroll Professional ($)
- Payroll Manager $35
- Payroll Specialists $28

TALENT ACQUISITION
- Professional in Human Resources ($)
- Sr. Professional in Human Resources ($)
- Talent Acquisition Manager $36
- Recruiter $21

COMPENSATION & BENEFITS
- Certified Compensation Professional ($$)
- Certified Employee Benefit Specialist (CEBS) ($$)
- Certified Benefits Professional ($$$)
- Compensation & Benefits Manager $39
- Compensation & Benefits Analyst $28

HUMAN RESOURCES MANAGEMENT
- Professional in Human Resources ($)
- Sr. Professional in Human Resources ($)
- Global Professional in Human Resources ($$$)
- H/R Labor Relations Manager $40
- H/R Labor Relations Specialist $30
BUT THIS IS STILL NEW TERRITORY
ONLY A FEW CERTS HAVE CURRENCY WITH EMPLOYERS

<table>
<thead>
<tr>
<th>Time Range: Last 12 months</th>
<th># of Job Postings</th>
<th>Cumulative Percentage of Job Postings Requesting Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job postings requesting a Top 50 Certification</td>
<td>1,912,496</td>
<td>67%</td>
</tr>
<tr>
<td>Job postings requesting a Top 100 Certification</td>
<td>2,231,460</td>
<td>78%</td>
</tr>
<tr>
<td>Job postings requesting a Top 200 Certification</td>
<td>2,499,844</td>
<td>88%</td>
</tr>
</tbody>
</table>
CASE STUDY: NORTHEASTERN UNIV.: CREATING TARGETED PROGRAMS FOR LOCAL JOB MARKET DEMAND

Job postings related to Master’s programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Boston-area postings in the last 12 months</th>
<th>US-wide postings in the last 12 months</th>
<th>Concentration of jobs in Boston relative to the nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytics</td>
<td>10,071</td>
<td>186,137</td>
<td>Higher</td>
</tr>
<tr>
<td>Regulatory Affairs</td>
<td>3,097</td>
<td>23,555</td>
<td>Much higher</td>
</tr>
<tr>
<td>Cybersecurity</td>
<td>1,939</td>
<td>62,658</td>
<td>About the same</td>
</tr>
<tr>
<td>Health Informatics</td>
<td>1,905</td>
<td>63,904</td>
<td>About the same</td>
</tr>
<tr>
<td>User Interface Design</td>
<td>1,506</td>
<td>22,079</td>
<td>Much higher</td>
</tr>
<tr>
<td>Engineering Management</td>
<td>1,162</td>
<td>29,671</td>
<td>Higher</td>
</tr>
<tr>
<td>E-Learning</td>
<td>218</td>
<td>8,160</td>
<td>About the same</td>
</tr>
</tbody>
</table>

Job-posting counts in the table are derived from Burning Glass’s database of online classifieds. For each program of study, analysts identified the number of postings with relevant job titles and skills and education requirements.

Graphic: Boston Globe

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Top Occupations – Biotech Sector in MA

- Medical Scientists, Except Epidemiologists
- Managers, All Other
- Medical and Health Services Managers
- Software Developers, Applications
- Biologists
- Chemists
- Marketing Managers
- Regulatory & Compliance
- Registered Nurses
- Medical and Clinical Laboratory Technicians
- Clinical Research Coordinators

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FIND TARGETED OPPORTUNITIES

DESIGN AROUND INDUSTRY NEEDS

Top Skills for Regulatory/Compliance Jobs

<table>
<thead>
<tr>
<th>Skill</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Affairs</td>
<td>2,500</td>
</tr>
<tr>
<td>Labeling</td>
<td>1,500</td>
</tr>
<tr>
<td>Legal Compliance</td>
<td>1,000</td>
</tr>
<tr>
<td>Medical Device</td>
<td>750</td>
</tr>
<tr>
<td>Product Development</td>
<td>500</td>
</tr>
<tr>
<td>Collaboration</td>
<td>500</td>
</tr>
<tr>
<td>Chemistry</td>
<td>500</td>
</tr>
<tr>
<td>Drug Development</td>
<td>500</td>
</tr>
<tr>
<td>Regulatory Documents</td>
<td>500</td>
</tr>
</tbody>
</table>

Biotech Firms Seeking Regulatory / Compliance Talent, Massachusetts

<table>
<thead>
<tr>
<th>Firm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amgen</td>
</tr>
<tr>
<td>Sanofi Aventis</td>
</tr>
<tr>
<td>Medtronic</td>
</tr>
<tr>
<td>Novartis</td>
</tr>
<tr>
<td>Takeda Pharmaceuticals</td>
</tr>
<tr>
<td>Pfizer</td>
</tr>
<tr>
<td>Abbvie</td>
</tr>
<tr>
<td>Baxter International</td>
</tr>
<tr>
<td>Becton Dickinson</td>
</tr>
</tbody>
</table>

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By coupling a field-specific skill set with the soft skills that form the foundation of a liberal education, **Liberal Arts graduates can nearly double the number of jobs available to them.** And these additional jobs offer an average **salary premium of $6,000**.

<table>
<thead>
<tr>
<th>Liberal Arts Jobs</th>
<th>Entry-Level Job Postings</th>
<th>Average Entry-Level Salary</th>
<th>Percent of Bachelor’s Entry-Level Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jobs Traditionally Open to Liberal Arts Graduates</td>
<td>954,996</td>
<td>$42,731</td>
<td>25%</td>
</tr>
<tr>
<td>Jobs Open to Liberal Arts Graduates with Additional Technical Skills</td>
<td>861,572</td>
<td>$49,052</td>
<td>23%</td>
</tr>
<tr>
<td><strong>Total Entry Level Jobs Accessible to Liberal Arts Graduates</strong></td>
<td><strong>1,816,568</strong></td>
<td><strong>$45,729</strong></td>
<td><strong>48%</strong></td>
</tr>
</tbody>
</table>

*The remaining 52% of entry-level jobs are in occupations that require specialized degrees or certifications – such as nurses, engineers, and accountants – and therefore aren’t open to Liberal Arts graduates without considerable additional study.*
We identified eight skill sets that Liberal Arts graduates can develop through a modest amount of coursework, such as a minor or online training or internships, that double their job prospects:

- **IT Networking & Support**
  - $1,058 premium
  - 66,429 postings

- **Sales**
  - 567,855 postings

- **General Business**
  - $11,144 premium
  - 577,787 postings

- **Data Analysis & Management**
  - $12,703 premium
  - 136,757 postings

- **Marketing**
  - $336 premium
  - 359,916 postings

- **Graphic Design**
  - $9,188 premium
  - 134,090 postings

- **Computer Programming**
  - $17,753 premium
  - 52,822 postings

- **Social Media**
  - $3,424 premium
  - 399,577 postings

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PROVIDING A CAREER STRUCTURE AROUND CORE PROGRAMS

Traditional Career Ladder: Web Development and Design

- Internship
- Junior/Mid-Level Web Designer
- Webmaster/Administrator
- Senior Web Designer
- UI/UX Designer

The Liberal Arts Path

- Anthropology Major
- Internship
- Junior Web Designer
- Senior Web Designer
- UI/UX Designer

- Specialization: HTML/CSS, Adobe Suite, Graphic Design
- Certificate Programs
How do I make my degree look relevant?

Does this candidate have relevant skills?

**LIBERAL ARTS DEGREE**

- SOC 224 Org Theory
- POL 312 Survey Research
- HIS 247 Hist. of Labor Relations
- ECO 131 Intro to Statistics

**HUMAN RESOURCE MANAGEMENT CERTIFICATE**

**INCREASED JOB OPPORTUNITIES**
THE PATH FORWARD

We need to ensure that foundational skills come first.

And allow students to pick up technical skills as they go, in school and afterwards.

Students need a road map of what to learn—and when.
JOBS ARE LIKE SUPERNOVAS

They’re born, they shine, and they die.

We need an educational system that is oriented around a dynamic job market, and helps people find their way to the next star.