Big Data Visualization & Analytics: Bridging the Skills Gap
Rajiv Malkan, Ph.D.
Lone Star College - Montgomery
Executive Briefing
After Executive Lunch
How will your students change the world?

How can students change our world?
To narrow the skills gap - Provide the expertise to our students that is needed by business and industry
McKinsey Study:

Educational systems have not kept pace with the changing nature of work, resulting in many employers reporting they cannot find enough workers with the skills they need.
Now Hiring
Data Convergence

Big Data: The four Vs
Volume, Velocity, Variety and Value

- **Volume**: Large amounts of data
- **Velocity**: Need to be analysed quickly
- **Variety**: Different types of unstructured and structured data
- **Value**: Extracting business insights and revenue from data
Data Convergence

Talent Pool: IT Pros Will Shoulder a Greater Storage Burden

230 GB PER IT PRO

28 MILLION IT PROS WORLDWIDE

2014

1,231 GB PER IT PRO

36 MILLION IT PROS WORLDWIDE

2020

Source: IDC, 2014
Digital Economy

Automation

- Robotics
- Artificial Intelligence
- Machine Learning
Digital Economy

By 2019 - Volvo said all its cars would be hybrids
Schwab Intelligent Portfolios®
Investing made easier.

It's a Simpler, Smarter Way to Invest:

- We build, monitor and automatically rebalance a portfolio of low-cost exchange-traded funds
- Pay $0 advisory fees, account service fees or commissions—and you can get started with as little as $5,000
- You can get help from a Schwab investment professional any time, 24/7
Digital Economy

Automation

MGI research findings:

- 60% of all occupations have at least 30% of activities that can be automated
Digital Economy

Digital Platforms

- E
- upwork (formerly oDesk)
- salesforce
- Uber
- Predix™
  The Software Platform for the Industrial Internet

GE Software
Digital Economy

Digital Wallet

Venmo

Zelle

Bitcoin

Apple Pay
Dollar Value of withdrawals at U.S. ATMs

$800 billion


2009  $650 billion
ATMs

Introduced 50 years ago

JPMorgan Chase – increased number of ATMs by 4%, but closed 3% of branches

Citigroup – added 30,000 ATMs locations at retailer
Changing Nature of Work
Digital Platforms enables more Independent Workers
MGI Research: 20-30% of working age population in US and Europe is engaged in independent work
Changing Nature of Work

Medium and low-skill workers are not advancing financially – across all age groups

Household incomes in the advanced economies have been stagnated or fell for about 2/3 of households in 2005-2014.
Changing Nature of Work

McKinsey Survey:

- 40% employers said lack of skills were the main reason for entry-level job vacancies
- 60% said that new graduates were not adequately prepared for the world of work
- Gaps in high tech skills
- Poor soft skills – communication, teamwork and punctuality
Changing Nature of Work

McKinsey Study:

- Growing role of big data in the economy and in business will create a significant need for data analysts.
- Estimate a shortfall of up to 250,000 data scientists in US alone in a decade
Data and Analytics
McKinsey Study:
Disruptive data-driven models and capabilities are reshaping some industries and could transform many more
Data and Analytics

Middle Skill Employment
Understanding the Opportunities and Skill Requirements for an IT Workforce
Data and Analytics

Middle Skills Report Findings – Data Analyst:

◦ Development with BI dashboard and visualization tools
◦ Microsoft and Tableau preferred.
◦ Working with Relational Databases such as MS SQL Server. Writing SQL scripts.
Data and Analytics

Big Data

Ground-Breaking Analysis of Employment in the Information Economy
Data and Analytics

• Skilled in SQL and data analysis and visualization tools such as R, SAS, STATA, SPSS, and Tableau.
• Data Visualization – Data related skills
• R programming Skills
• Microsoft and Tableau
Data and Analytics

Burning Glass – Analysis for Houston Metropolitan Region

- Over 4000 jobs related to Business Intelligence/Business Analyst, etc.
- Skills – PowerBI, Tableau, SAS, R, Data Visualization
BI Magic Quadrant

As of February 2017
Burning Glass – Houston Metro Report

Top Employers posting for Business Intelligence Analysts
Jun. 01, 2016 - May 31, 2017

There are 1,900 postings available with the current filters applied.
Incorporating Skills

Curriculum

◦ Texas State mandate in 2015 to reduce all AAS degrees to 60 credit hours
◦ Had to reduce curriculum from 68 credit hours to 60 credit hours
◦ No room to add additional courses to the curriculum
Incorporating Skills

Question

How to incorporate some data visualization and analytics tools in the curriculum?
Data Visualization & Analytics
Data Visualization & Analytics

- **Count of Student ID**: 15
- **Average of Final Exam**: 210.67
- **Median of Grand Total**: 804
- **Count of Letter Grade**
  - A: 4
  - B: 3
  - C: 3
  - D: 2
  - F: 3
- **Average of MIL Exams**
  - A
  - F: 0
Data Visualization & Analytics

- Total Stores: 104
- This Year's Sales: $22M

This Year's Sales by Chain:
- Lindseys
- Fashions Direct

New Stores, New Stores Target:
- Year to Date

This Year's Sales, Last Year's Sales by Fiscal Month:
- This Year Sales
- Last Year Sales

Total Sales Variance %, Sales Per Sq Ft, This Year's Sales by District:
- FD - 01
- LI - 03
- FD - 04
- Li - 05
- FD - 02

- Sales Per Sq Ft
- Total Sales Variance %

- Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec
Data Visualization & Analytics
# Programming Skills – TIOBE Index

<table>
<thead>
<tr>
<th>Jul 2017</th>
<th>Jul 2016</th>
<th>Programming Language</th>
<th>Ratings</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Java</td>
<td>13.774%</td>
<td>-6.03%</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>C</td>
<td>7.321%</td>
<td>-4.92%</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>C++</td>
<td>5.576%</td>
<td>-0.73%</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Python</td>
<td>3.543%</td>
<td>-0.62%</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>C#</td>
<td>3.518%</td>
<td>-0.40%</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>PHP</td>
<td>3.093%</td>
<td>-0.18%</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>Visual Basic .NET</td>
<td>3.050%</td>
<td>+0.53%</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>JavaScript</td>
<td>2.606%</td>
<td>-0.04%</td>
</tr>
<tr>
<td>9</td>
<td>12</td>
<td>Delphi/Object Pascal</td>
<td>2.490%</td>
<td>+0.45%</td>
</tr>
<tr>
<td>10</td>
<td>55</td>
<td>Go</td>
<td>2.363%</td>
<td>+2.20%</td>
</tr>
</tbody>
</table>
Are you ready to add some data visualization and analytics skills in your curriculum?
Questions?

Thank You!!

Sun is always Shining
because
We have an opportunity to change lives

High-Skill – High Wages
Contact

Rajiv Malkan
Professor
LoneStar College – Montgomery

rajiv.malkan@lonestar.edu