The Future of Work

9:00 – 10:15am
June 14, 2019
The Future of Work

Joylin Kirk
Burning Glass Technologies
1. Building your skill foundation
2. Adding transferrable skills
3. Life long learning for the hybridization of jobs
Foundational Skills of the Digital Economy

- Human skills
- Business enablers
- Digital building blocks
Demand for Foundational Skills

- Spans all ability levels
- Opportunities for further learning
- Increased job mobility
Transferrable Skills

<table>
<thead>
<tr>
<th>SKILLS</th>
<th>TOTAL OPENINGS</th>
<th>RANK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>8,657,707</td>
<td>1</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>5,776,671</td>
<td>2</td>
</tr>
<tr>
<td>Collaboration</td>
<td>4,997,561</td>
<td>3</td>
</tr>
<tr>
<td>Creative and Critical Thinking</td>
<td>4,543,580</td>
<td>4</td>
</tr>
<tr>
<td>Customer Service</td>
<td>3,831,705</td>
<td>5</td>
</tr>
<tr>
<td>Organizational Skills</td>
<td>3,744,496</td>
<td>6</td>
</tr>
<tr>
<td>Sales</td>
<td>2,744,465</td>
<td>7</td>
</tr>
<tr>
<td>Microsoft Excel</td>
<td>2,737,512</td>
<td>8</td>
</tr>
<tr>
<td>Physical Abilities</td>
<td>2,659,991</td>
<td>9</td>
</tr>
<tr>
<td>Scheduling</td>
<td>2,656,007</td>
<td>10</td>
</tr>
<tr>
<td>Ethical Reasoning and Mindset</td>
<td>939,967</td>
<td>31</td>
</tr>
<tr>
<td>Leadership</td>
<td>899,359</td>
<td>32</td>
</tr>
<tr>
<td>Accounting</td>
<td>826,711</td>
<td>33</td>
</tr>
</tbody>
</table>
Entry Level Occupations

- 78% of all high paying entry level jobs
- 0-2 years of experience
- >1 transportable skill

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>SHARE OF OPENINGS REQUESTING TRANSPORTABLE SKILLS</th>
<th>MEDIAN ENTRY-LEVEL SALARY</th>
<th>MEDIAN SALARY FOR ALL EXPERIENCE LEVELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Analyst</td>
<td>79%</td>
<td>$60,000</td>
<td>$68,000</td>
</tr>
<tr>
<td>Network Administrator</td>
<td>74%</td>
<td>$65,000</td>
<td>$74,000</td>
</tr>
<tr>
<td>Business Analyst</td>
<td>72%</td>
<td>$66,000</td>
<td>$77,000</td>
</tr>
<tr>
<td>Auditor</td>
<td>71%</td>
<td>$65,000</td>
<td>$74,000</td>
</tr>
<tr>
<td>Data Analyst</td>
<td>71%</td>
<td>$60,000</td>
<td>$68,000</td>
</tr>
</tbody>
</table>
Disruptive Skills - Not always new skills

Skills spread over time
Occupations with at least 10,000 postings requesting creativity skills

2018
Product manager, computer systems engineer, network engineer, program manager, general manager, human resources specialist
35 occupations

2015
IT project manager, systems analyst, public relations specialist
24 occupations

2012
Software developer, marketing manager, retail store manager, restaurant supervisor, marketing specialist, business analyst
14 occupations
Hybrid Salary

The hybrid salary premium also bears out in traditional roles that now require new skills.
Recommendations

- Recognize the essential skills
- Build teaching and learning around these skills
- Emphasize the balance between skills
- Require students to demonstrate skills
- Coordinate with employers for job skill development
Two Questions:

1. What can we confidently assert will remain uniquely human value contributions to collective human/machine intelligence 10-20 years out?

2. How do we reverse engineer those into today’s K-12 curriculum?
• STEM to STEAM to THAMES
• Re-centrality of Humanities
• A New Kind of Humanities
• A new relationship to information
• 3 C’s Economy (Creating, Cyber-curating, Caring)
Diversity and Ethical Implications of Advances in Artificial Intelligence (AI)

Unintended Consequences on Steroids
Unintended Consequences on Steroids

The Ripple Effect of AI Due to the Lack of Transparency in Datasets, Algorithms and more!
OVERVIEW

1. The Arrival of AI: Already Transforming How We Live – Learn and Work
2. Understanding Ethical Risks – Blind Spots – Bias & Inequity in AI
3. Major Collateral Damage: The Ripple Effect of AI Due to Lack of Transparency in Datasets & Algorithms
4. Better Together: Humans + Machines
5. Possible Solutions!
ARTIFICIAL INTELLIGENCE IS BUILT ON THREE FOUNDATIONS:

- **Algorithms**
- **Data**
- **Computing power**

Artificial Intelligence at its core, is a byproduct of *algorithms* and *data.*

And Why the Dataset Matters!
Artificial Intelligence

AI: Systems/Machines mimicking human skills such as vision, listening, reasoning and moving

1956
THE FATHER OF AI: JOHN MCCARTHY 1927 – 2011

2008
BIG DATA + COMPUTING

2011
JOHN MCCARTHY PASSED AWAY

2012
AI BREAKTHROUGH

2025 - 2030
AI WILL CHANGE HOW WE LIVE – LEARN & WORK
Artificial Intelligence

- **Machines** - Reasoning/thinking like **humans**

- John McCarthy created the standard: **AI programming language** (Lisp) – is still being used today (from search engines, recommendations and credit card fraud detection)

* Alan Turing presented first lecture on intelligent machines (1947)
AI Project Life-cycle

7 Key Steps

Conceptualization
Use Case (purpose)

Question

Datasets
(Data collection)

Data
Normalization
Preparation

Algorithms
Training sets/
Model
Development/
Test

Model
Implementation
(Pattern recognition)

Insights and
Decision-
making

Prototyping

Policies/Protocols

(Be aware of risks of potential bias/unethical use cases & questions)
How AI Bias & Unethical Issues Could Happen

Internal Policies

How You Define Fairness

Unknowns unknowns

Lack of Transparency
The conundrum of sourcing reliable, relevant and accurate data:

- Over 2.5 exabytes of data is created every day
- Less than 5% of the available unstructured data is being used
- 70% - 80% of an analyst’s time is spent on data cleaning/preparation
- Data construction/derived attributes
- Selecting/Evaluating historical data (historical inequities...)

The Risks of Algorithms Generated Datasets
Unreliable Dataset: Major Collateral Damage

1. Gender Inequity/Discrimination/ Biases/Unfairness
2. Erosion of Privacy & Trust
3. Life Altering Impact: can cause irreparable harm (Ex: bias in financial services & justice)
4. Diversity Recruiting (STEM – Pipelines)
5. Poor Accountability
Datasets that are used to train AI systems are **not inclusive** and often do not reflect the population/object/environment of the systems they are designed to serve...

• The **Quality** of data that we use to train artificial intelligence could **alter the course of history** for generations to come...
Addressing the Bias Within AI: The Path Forward

What seems to dominate the landscape

1. Using unreliable/unrepresentative datasets and writing algorithms to fix potential bias/blind spots
2. Creating systems or building bots and considering plans to deal with the unintended consequences later – who says you’re to be able to fix it (Ex: data privacy)
3. Driven by speed to market because of FOMO (fear of missing out)
4. Just because you can build it — does not mean you should
5. Winner takes all mentality, ignoring collateral damage

Options to consider

Adopting Steps to Improving Transparency in AI:

1. Methods and processes that are used to build systems should be available to an entity or academy for auditing
2. Talent Management: (hiring and investing in diversifying the AI field)
3. All AI Projects should develop quality control protocols, including pre-processing and data privacy procedures
4. Designing Inclusive Systems
5. Building Representative Datasets (reflecting the diversity and inclusiveness of the real-world)
6. Third Party Testing/Auditing entity to assess commercial AI systems
7. Add Digital Signatures on products that meet ethical standards
Where Do We Go from Here?

AI by humans for humans

“Better Together. Understanding this key attribute and finding the equilibrium between humans + machines remains a serious equation that smart enterprises need to resolve in order to stay viable in business.”
- Journel Joseph
Figure 1. A new mind-set for the no-collar workforce
Humans and machines can develop a symbiotic relationship, each with specialized skills and abilities, in a unified workforce that delivers multifaceted benefits to the business.

AI: The Fate of a Nation

K-12 and AI Readiness

As Educators, Principal Investigators, Researchers, Managers, Parents: What Are You Willing to Do to Avoid A Future of Unintended Consequences?
THANK YOU!