The Future of Work: Prepare Yourself

Kimberly A. Smith, PhD, MT(ASCP)
Susan H. Fenton, PhD, RHIA, FAHIMA
University of Texas School of Biomedical Informatics
Objectives

• Describe technical and societal forces that will change the way we work and the work environment

• Discuss the knowledge and skills needed to be prepared for the future of work

• Identify resources to gain the needed knowledge and skills
Did you ever wonder what happened to...

- Typewriters
- Encyclopedia Britannica
- Travel agents
- Travelers checks
- Personal digital assistants
- Modems
- Answering machines
- Dictation devices
What is anticipated to disappear in the future?

- Portable digital media (USB drive, DVD, Blu-ray)
- House keys
- Home phones
- Cash, and, possibly, credit cards
- Cars requiring a driver
- Many jobs
What are the technical forces driving this change?

The Law of Accelerating Returns – information technology progresses exponentially

Ray Kurzweil
Today’s Technical Forces

• The Internet of Medical Things (IoMT) – will reach $136.8 billion by 2021 (Allied Market Research)

• Big (healthcare) Data – 2,314 exabytes by 2020

• Machine learning
  – ID of diseases and diagnosing
  – Drug discovery
  – Image analysis
Today’s Societal Forces

• 2.1 billion of more than 9 billion will be over the age of 60 by 2050 (United Nations, 2017)

• Projected decline in working-age population between 2030 and 2050 in all countries but Africa

• Millennials are the largest generation in the U.S. workforce (Pew, 2017)

• Multi-generational and other shared living arrangements are increasing
Generations by the numbers

<table>
<thead>
<tr>
<th>Generation</th>
<th>Years</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silent Generation</td>
<td>Before 1945</td>
<td>25.68 million</td>
</tr>
<tr>
<td>Baby Boomers</td>
<td>1946–1964</td>
<td>73.47 million</td>
</tr>
<tr>
<td>Generation X</td>
<td>1965–1976</td>
<td>65.71 million</td>
</tr>
<tr>
<td>Millennials or Gen Y</td>
<td>1977–1995</td>
<td>71.86 million</td>
</tr>
<tr>
<td>Gen Z or Centenials</td>
<td>1996–now</td>
<td>86.43 million</td>
</tr>
</tbody>
</table>

Note: Labor force includes those ages 16 and older who are working or looking for work. Annual averages shown.

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What will this mean for the work environment?

• Job Types
• Job Responsibilities
• Working Conditions
• Working Requirements
• Cultural Changes
Jobs – Impact of Automation

Digital technologies have boosted productivity in the United States without also spurring the expected job growth, argue Erik Brynjolfsson and Andrew McAfee. A result of this decoupling is that while gross domestic product (GDP) has risen, median income has not, and inequality has grown.
Working Conditions

• 43% of employed Americans will work remotely or with a flexible schedule (remote coding anyone?) (Forbes, 2016)
• Workplace monitoring
• More emphasis on work-life balance
• Specialization, especially with technical skills, has become more prominent
• Specific job titles are less important
Cultural Changes

• Widening age gap in workers
• Digital natives
• More relaxed/less formality
• Globalization
Advanced vs. Emerging Economies

- What are the drivers?
  - Working-age population growth
  - Investment in human capital
  - Education!
  - Investment in physical capital
  - Total productivity

Pew, The World in 2050 (February 2017)
Projected Impact on HIM Careers

• Release of Information – likely to be automated
  – Blockchain
  – Rise of biometrics
  – Advanced document analysis techniques
  – Continued compression of timeframes
Projected Impact on HIM Careers

• **Coding** – likely to be automated
  – Encoders and computer-assisted coding already exist
  – Amazon Comprehend Medical and Google Natural Language make NLP affordable for almost everyone
  – All it really lacks is the killer app
Example:
Amazon Comprehend Medical

• Can examine unstructured clinical text to detect textual references to medical information such as:
  – medical condition
  – treatment
  – tests and test results
  – medication (including dosage, frequency, method of administration, and so on)
  – PHI data, and so on.

(https://docs.aws.amazon.com/comprehend/latest/dg/how-medical-works.html)
Example:
Amazon Comprehend Medical

• Can also detect PHI — Examines unstructured clinical text to detect textual references to protected health information (PHI) such as names and addresses.

(https://docs.aws.amazon.com/comprehend/latest/dg/how-medical-works.html)
Yes, but what about Clinical Documentation Improvement?

• Likely to be automated
• Real-time CDI guidance and feedback
• Companies currently employing artificial or augmented intelligence for CDI
  – M*Modal
  – Optum
  – Nuance
The Future for Traditional HIM

What’s left?!?

• The data

• Do you know how to:
  – manage the data from a variety of perspectives?
  – access all of the data and turn it into information?
  – incorporate information into the daily flows for everyone (patients, providers, managers)?
  – try to build organizational knowledge?
OK – How do I prepare for the future?

• Get over the fear!
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• Get ready to learn!
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This is homework for your life!
What do I need to learn?

- **Novel and adaptive thinking** – think through problems even in the face of unknowns
- **Sensemaking** – negotiation and creation of meaning
- **Computational thinking** – requires decomposition, pattern recognition, abstraction, and algorithms
- **Virtual collaboration** – working effectively in shared spaces and video conferences
- **Cross-cultural competency** – working effectively with lots of people who do not necessarily look or think like you
Statistical Skills

• Basic statistics
  – From community college or online courses
• Coursework in using R and R-Studio
  – Free self-learning courses available online from Google, Coursera, eDx, Udacity, Datacamp, etc.
Programming Skills

• MySQL - codecademy
• Python Programming
  – Materials available for high-school children to learn Python programming
  – Self-paced learning courses available online from Google, Coursera, edX, Udacity, Datacamp, etc.
Information Skills

• How to search using keywords in Google, Bing
• Search for job descriptions in job websites like Glassdoor, Indeed
• Familiarize yourself with tools, programming language and topics in informatics
Formal Coursework

• Massive Online Open Courses
  – Coursera
  – edX
  – Datacamp.com
• University-based certificate programs
• Undergraduate and Graduate Degrees
Example

Johns Hopkins Data Science courses in Coursera (58 courses)
Conclusions

• The world continues to change at faster and faster rates.
• The forces at play are substantial and HIM is NOT going to stop them
• Formerly essential HIM jobs are likely to disappear in the future.
• Preparing now is essential.
• Lots of resources are available.
Resources List

• Codecademy: https://www.codecademy.com/
• Coursera: https://www.coursera.org/
• Datacamp: https://www.datacamp.com/
• edX: https://www.edx.org/
• Lynda.com: https://www.lynda.com/
• SQLCourse: http://www.sqlcourse.com/intro.html
• SQLZoo: https://sqlzoo.net/
• Udacity: https://www.udacity.com/
• Udemy: https://www.udemy.com/
• W3Schools: https://www.w3schools.com/
QUESTIONS

Susan H. Fenton, PhD, RHIA, FAHIMA

susan.h.fenton@uth.tmc.edu
References


