Will AI Usurp White Collar Jobs

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Defining Artificial Intelligence (AI)...

From steam engines to unattended factories, from the ENIAC computer to big data and from neural net devices to self-driving cars and singularity.

<table>
<thead>
<tr>
<th>Industrial revolution (mechanical power)</th>
<th>Digital revolution (computer power)</th>
<th>AI revolution (brain power)</th>
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<tbody>
<tr>
<td>Substituting, supplementing and/or amplifying routine manual tasks</td>
<td>Substituting, supplementing and/or amplifying standardized mental tasks</td>
<td>Substituting, supplementing and/or amplifying practically all mental tasks</td>
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<tr>
<td>1712 Newcomen’s steam engine</td>
<td>1946 ENIAC Computer</td>
<td>1990 Neural net device reads handwritten digits</td>
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<td>1784 Watt’s double action steam engine</td>
<td>1950s IBM’s business computers</td>
<td>1993 Robot Polly navigates using vision</td>
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<td>1830 Electricity</td>
<td>1970s Electronic data processing (EDP)</td>
<td>1997 Deep Blue defeats the world chess champion</td>
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<td>1876 Otto’s internal combustion engine</td>
<td>1971 Time-sharing computers</td>
<td>1998 Robotic toy Furby learns how to speak</td>
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<td>1890 Cars</td>
<td>1973 Microprocessor</td>
<td>2005 Robot ASIMO serves restaurant customers</td>
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<td>1901 Electricity in homes</td>
<td>1977 Apple’s computer</td>
<td>2009 Google’s first self-driving car</td>
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<td>1914 Continuous production line</td>
<td>1980s Computers with modems</td>
<td>2011 Watson computer beats Jeopardy’s</td>
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<td>1919 Electricity in one-third of homes</td>
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<td>2016 AlphaGo defeats GO champions using</td>
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**Actual use of**

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<th>Actual use in 2015</th>
<th>Widespread use of</th>
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<tr>
<td>1950s Electrical appliances</td>
<td>2015 61% of Americans use smartphones</td>
</tr>
<tr>
<td>1960s Cars</td>
<td>2015 Amazon most valuable US retailer (surpassing Walmart)</td>
</tr>
<tr>
<td>1970s Long-distance telephones</td>
<td>2015 37% of employees in USA work from home (full-time or part-time)</td>
</tr>
<tr>
<td>2010 Unattended factories</td>
<td>2015 Collecting/Exploiting Big Data</td>
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<td>2027 Computer translations</td>
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<td>2027 Self-driving cars</td>
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<td></td>
<td>2027 Deep neural learning</td>
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<td>2027 Machines reach human intelligence</td>
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Makridakis, 2017
Artificial Intelligence is the science of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence. (John McCarthy, Stanford University 2007)

Machine learning enables a computer system to independently learn from, and continuously adapt to, data without being explicitly programmed for that data. Machine learning is a crucial component in many artificial intelligence systems.

The evolution continues…

Machine - A piece of equipment with moving parts that does work when it is given power from steam, electricity, gasoline, etc. (Merriam Webster Dictionary)

the science of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence. (John McCarthy, Stanford University 2007)
What is the most valued capital?

Financial capital was king – to secure land, labour, raw materials

Human Talent/Resources

AI

Industrial Revolution
1760 -1840 – Hand to machine production (e.g. textiles)
1760 -1840 – Second Large scale manufacturing powered by steam & steam powered transport.

Information Age
Industry became more knowledge intensive;
value of financial diminished.
1941 –starting with Claude Shannon working for Bell Labs developed information theory leading to modern computing.

The new source of competitive advantage – innovation, efficiency and effectiveness – creating value for shareholders/stakeholders.
1956 - John McCarthy, a math professor at Dartmouth College, came up with the idea that a machine could simulate every aspect of learning if described precisely to it.

So what? We always have had machines! (Part 1)

First they reduced the importance of blue collar jobs
Luddite

a member of any of the bands of English workers & craftsmen who destroyed machinery, especially in cotton and woollen mills, that they believed was threatening their jobs (1811–16).

So what? We always have had machines! (Part 2)

First they reduced the importance of blue collar jobs

Next they assisted in the growth of white collar jobs especially in the service industry

Now they are threatening to usurp white collar jobs
In the same way computer automation has done away with lots of blue collar jobs over recent decades, AI and robotic process automation will have a similar impact on white-collar roles in areas ranging from HR to Finance. (Personnel Today, 2015).

AI will have a dramatic impact on the workforce, resulting in staff having to be trained and up-skilled to work in higher value areas.
A new Softchoice study (2017) of 1000 North American office workers reveals one in four is worried their job will be replaced by technology within five years – they believe human resources is one of the most at-risk jobs alongside accounting, administration, sales and IT.

http://www.hrmonline.ca/hr-news/hr-technology/can-ai-really-replace-humans-in-hr-230898.aspx
The future of employment study

About 47 per cent of current jobs in the USA are at high risk of computerization over the next 20 years, according to a study by researchers at Oxford University (Frey and Osborne, 2013).

Some insights into this study follow
This research concludes that of 702 occupations that it assessed, the following white-collar jobs as most likely to be replaced by AI based on breakthroughs in machine learning and mobile robotics:

- Human resource assistants
- Surveyors
- Judicial law clerks
- Cost estimators
- Market research analysts and marketing specialists
- Civil engineering technicians
- Electrical and electronics drafters
- Medical transcriptionists
- Technical writers
- Tax examiners
- Collectors
- Revenue agents
- Accountants and auditors
- Paralegals and legal assistants
- Gaming dealers
- Cashiers
- File clerks
- Credit authorizers
- Checkers
- Clerks
- Claims adjusters
- Examiners
- Investigators
- Credit analysts
- Loan officers
- Data entry keyers
- Insurance underwriters
Some examples...(1)

Law firms now rely on computers that can scan thousands of legal briefs and precedents to assist in pre-trial research. Sophisticated algorithms are gradually taking on a number of tasks performed by paralegals, contract and patent lawyers.

Computerized speech recognition provide advanced speech recognition using machine learning that improves conventional interactive voice response systems, realising cost savings of 60 to 80 per cent over an outsourced call centre attended to by human labor.
Some examples...(2)

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<th>Education is another labor-intensive sector that could soon be served by AI. The rise of massive open online courses has begun to generate large data sets detailing how students interact on forums, their diligence in completing assignments and viewing lectures, and their ultimate grades. Such information will allow for machine learning algorithms that serve as interactive tutors, with teaching and assessment strategies statistically calibrated to match individual student needs.</th>
</tr>
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<tbody>
<tr>
<td>Oncologists at Memorial Sloan-Kettering Cancer Center are using IBM’s Watson computer to provide chronic care and cancer treatment diagnostics. <strong>Health care employees involved in diagnostic tasks are at risk of becoming redundant.</strong></td>
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</table>
Whose jobs will be affected in hospitals?
Technology is constantly challenging industry assumptions of what HR can and can't do.

Richard Lobo, executive vice-president and head, HR, Infosys. "Robotics, as a technology, is slowly making inroads into HR and one of the forerunners are chatbots.

Following automation and analytics, robots -- more specifically software bots -- are considered the future of HR, with a growing number of organisations acknowledging their vast potential.

http://www.rediff.com/business/report/will-robots-take-over-hr/20170727.htm
Chatbots in action

DoNotPay bot provides free legal help

Pegg Bot by Sage keeps track of your expenses

Matilda bot provides advice on pensions

Financial Advisor

Teacher

Accountant

Lawyer

Sage keeps track of your expenses

Leslie The English Bot

WebMD bot with answers to your health questions

Doctor

Personal Stylist

Food Order

Sephora Bot provides advice for makeup and grooming

Chatbots as your

Examples of Chatbots in Use Today

TacoBot by Tacobell – way to order your Tacos

https://medium.com/@humansforai/exploring-chatbots-they-are-here-to-stay-916d0fca498a
Robotic Process Automation (RPA)

Bots as a form of AI don’t necessarily take up physical space. Instead, they are programs, stored on a desktop or a cloud, that have the ability to learn and adapt to different situations as opposed to earlier programs that were more rigid. Because of their learning capabilities, these bots can perform tasks that were deemed impossible by earlier programmers: Robots can write stories, they can understand human speech, and they can diagnose a patient better than their own doctor can.

Naturally, these capabilities have not gone unnoticed by the business community, and there is currently talk about how these powerful machines can be integrated into the workplace. An example of software robots making their way into the business world and snagging up repetitive and predictable jobs is the use of robotic process automation (RPA).

https://hrtrendinstitute.com/2017/05/15/how-will-the-rise-of-robots-impact-hr/
Managing people in an AI future...

It is also highly likely that the trend towards a smaller payroll will continue as AI technologies will accelerate the number of tasks that can be performed by machines and robots.

The more jobs being automated however, the greater the skills that would be required to adequately perform the remaining tasks, for both the efficient operation of firms as well as for utilizing AI and other technologies in the best possible way.

This would require hiring talented employees and motivating them to get the most out of their performance in order to attain and maintain competitive advantages over other firms.

Hiring, motivating and successfully managing talented individuals would probably be one of the most critical success factors for firms in the AI era and would also be impossible to put into an algorithm.

The major differentiator would therefore come from these talented individuals conceiving and implementing innovative ideas and winning strategies that would steer the organization onto a successful path.
Infosys, HR Helpdesk, has implemented:

- an interactive virtual agent through which employees can get instant resolutions to their queries on policies and processes cutting out the need to raise need meet an HR executive.

- The company has created a huge knowledge repository that the interactive virtual agent uses to provide relevant responses.

- Since, the launch of the virtual agent in May 2016, nearly 10,000 employees have used it.

http://www.rediff.com/business/report/will-robots-take-over-hr/20170727.htm
HR needs to move from administrative to strategic role

AI technologies can easily be adapted to assist HR administrative/clerical functions such as in recruitment. AI-based machines being used to sift through CVs based on parameters pre-defined by recruitment personnel in order to boost productivity, save time and reduce errors.

Mundane tasks here will likewise be automated out of existence, the HR function will continue to play a strategic role.

HR professionals need to reinvent themselves with greater focus on improving their business acumen, leading and managing change, nurturing leaders and building organisations that can respond to the needs of a multi-generational workforce, while at the same time being adept at leading-edge technology like AI.

http://www.personneltoday.com/hr/artificial-intelligence-hrs-role-robot-taking-over/
HR personnel need to integrate people and machines

Robots are infiltrating our everyday lives; there’s no stopping them. The one question we need to ask ourselves is how do we adapt? **HR personnel need to scrutinise how this disruption** is affecting their respective industries and act accordingly. This involves **properly training and reskilling their current employees** as well as preparing them for this massive tectonic shift.

However, given the need for HR personnel **to help integrate people and machines**, HR must also **upgrade their technical expertise** and start engaging in constructive conversations with the entities working on the frontiers of this fascinating new technology.
Some interesting recent media headlines

- When your new co-worker is a robot
- Exit accountants, enter audit robots?
- Robo-Caregiving & Why You Might Delegate Your Loved Ones to a Robot.
- Teachers have 10 years before robots take over
- Can AI really replace humans in HR?
- Will Human Recruiting Survive in an AI Future?
- How hospitals can use AI to make hiring decisions
- Does AI herald the end for external recruitment agencies?
- Businesses are still failing to prepare for rise of AI
- AI May Soon Replace Even the Most Elite Consultants
Automation entering white-collar work
Video

https://www.youtube.com/watch?v=YbrfQaHsC6U
Since the 1950s, huge investments in capital equipment caused sharp declines of American share of employment in manufacturing from 30 per cent to less than 10 per cent. During the same period, jobs in services soared, from less than 50 per cent of employment to almost 70 per cent. (The Economist 2014)

Inevitable that firms would start to apply the same experimentation and reorganization to service industries – efficiency, effectiveness, innovation & competitive advantage.

HR departments could be served by AI: help to serve the line manager as their “first port of call” HR advisor, provide them with real time HR information & recruitment that would make these line managers more effective.

HR Professionals need to focus on playing a strategic role as opposed to administrative roles and be aware of the role of AI in workplaces (AI/RoBots as co-workers with humans). HR must upgrade their technical expertise & engage in constructive conversations with the entities working on the frontiers of this new technology.

CNBC - John McCarthy, a math professor at Dartmouth College, proposed a summer research project based on the idea that "every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." https://www.cnbc.com/2017/06/17/what-is-artificial-intelligence.html

- Siri; http://www.telegraph.co.uk/technology/2017/06/04/ai-moves-time-apples-siri-grow/
- Makridakis, A. 2017, The forthcoming artificial intelligence (AI) revolution: its impact on society and firms, Futures, 90, p.46-60.
- http://www.thehindubusinessline.com/opinion/exit-accountants-enter-audit-robots/article9838692.ece
- https://www.stuff.co.nz/technology/digital-living/96702527/teachers-have-10-years-before-robots-take-over
- http://www.hrmonline.ca/hr-news/hr-technology/can-ai-really-replace-humans-in-hr-230898.aspx
- http://hrnews.co.uk/ai-herald-end-external-recruitment-agencies/
- http://smallbusiness.co.uk/businesses-still-failing-prepare-rise-ai-2540562/