The Impact of Artificial Intelligence (AI) on Jobs:

America, Florida, and Sarasota

Capers Jones **Version 28.0** **September 23, 2024**

(Picture of a robot news anchor in 2024 created by artificial intelligence)

INTRODUCTION

The author of this report is retired from IBM and uses artificial intelligence tools daily for research.

Artificial intelligence (AI) is a new technology that is changing science, business, authorship and publishing, military operations, and medical care. Artificial intelligence will also have a major impact on U.S. employment. This article discusses seven critical questions of importance to national, state, and local governments, and also important to corporations, schools, and universities:

1. How many U.S. jobs exist in 2024?
2. How many jobs will artificial intelligence eliminate?
3. How many jobs cannot be done by artificial intelligence?
4. How many new jobs will artificial intelligence create?
5. What kinds of jobs will be lost to AI?
6. What kinds of jobs cannot be done by AI?
7. What kinds of new jobs will AI create?

Note 1: The AI tool Google Gemini was used for fact checking in this draft and to do research on employment statistics. Some of the illustrations were produced using artificial intelligence. As of 2024 AI-generated illustrations cannot be copyrighted. This means that new books using AI-generated illustrations will have many more illustrations than older books on the same topics.

Note 2: The author was invited by the Air Force to discuss new weapons controlled by artificial intelligence. On Augus 13, the author was keynote speaker in Beijing at a conference about artificial intelligence that had over 1000 people from 40 countries and the talk was given in 12 languages.

This article focuses on the U.S. economy. At the start of 2024 Google Gemini reports about 3.86 billion workers in the world. Of these perhaps 2 billion are at some risk of job loss due to artificial intelligence. Industrialized countries such as the United States and England are at greater than countries with more agricultural workers, such as China and some South American countries. Even so, artificial intelligence is a major threat and governments need to start planning now.

Before getting to the main topic of using artificial intelligence for political campaigns and government operations, it is useful to identify some of the available AI tools. Readers should check frequently because new AI tools are being created rapidly.

Note 3: People who work with INFORMATION can soon be replaced by artificial intelligence; but people who work with **TOOLS** are safe for now. This means that about 105 million out of 165 million U.S. workers are at risk, and about 4 million out of 7 million Florida workers are at risk and about 120,000 out of 180,000 workers in Sarasota county are at risk.

Examples of Free Artificial Intelligence Tools

ChatGPT	Probably the most widely used AI tool.
Google Gemini	Popular with Google email users
FOTOR AI	Used for images and art creation.
Jasper AI	Used for text and document content.
Lensa	Used for facial images.
Photosonic	Used for AI art and images.
Artbreeder	Used for AI art and images.
Bing Image Creator:	Used for AI art and images.
SORA	Used for AI text to animation

Readers should check the latest tools for generating pictures with artificial intelligence since new AI tools appear frequently.

ARTIFICIAL INTELLIGENCE (AI) AND OTHER IMPORTANT INVENTIONS

If you consider the inventions that have changed human lives artificial intelligence is certainly one of them:

1. Airplanes
2. Alcohol
3. Antibiotics
4. **Artificial intelligence**
5. Automobiles
6. Computers
7. Cell phones
8. Electric power
9. Gunpowder
10. Motion pictures
11. Nuclear power
12. Plastic
13. Printing Press
14. Radio
15. Steel
16. Telephones
17. Television
18. Transistors
19. Vaccines
20. Wheels

OVERVIEW OF THE IMPACT OF AI ON THE U.S. WORKFORCE

The Bureau of Labor Statistics reports that current U.S. employment is about 165 million people out of a population of about 321 million. Next is a summary of the kinds of jobs that may be at risk from artificial intelligence.

The jobs that are most at risk primarily are jobs that use and work with information rather than using or working with tools. People who use information without public contact such as authors could be replaced with little notice. But many people who use information need to be seen by customers such as reservation clerks or telephone customer support personnel.

Other jobs that cannot be replaced by AI are those that require outside movement such as firemen, police, delivery personnel, postal workers, and gardeners.

Readers who use computers and have downloaded an AI tool such as Google Gemini or Chat GPT can find out about job situations by asking:

"What impact will artificial intelligence have on newspaper jobs?"

"What impact will artificial intelligence have on magazine jobs?"

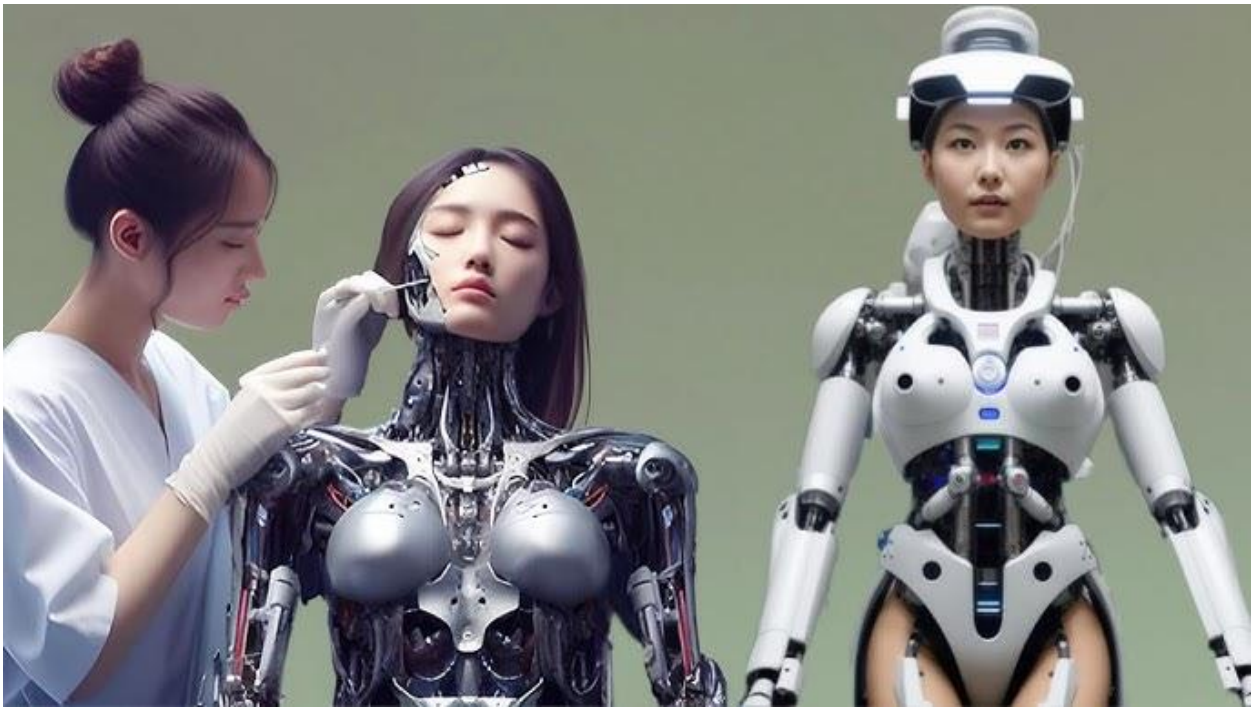
"What impact will artificial intelligence have on book publishing jobs?"

Having done this for over a dozen industries, the results are depressing. Google Gemini predicts job losses of over 15% in many industries by 2027.

For inside work and especially for work with telephones, computer generated "avatars" that look like real people can answer phones and even appear on television shows.

First is a picture of a robot waiting to replace a human for a future job in 2030:

Next is a picture of a young lady robot being constructed in Japan:



Next are front and rear views of a new robot controlled by artificial intelligence:

Next is a new robot that imitates Scarlett Johansen and is created by artificial intelligence:

Here is a fierce robot warrior created by artificial intelligence:

Here is a new Chinese female robot created by artificial intelligence:

Here are three more Japanese robots created by artificial intelligence:

Here is a Chloe, who is a model, created by artificial intelligence:

Next are new robots being finished in a Chinese robot factory:

The same robot can be used for many human faces:

Next are two male fashion models created by artificial intelligence:

Next is another new robot model who won a robot beauty contest:

Next is a robot model who looks like a robot:

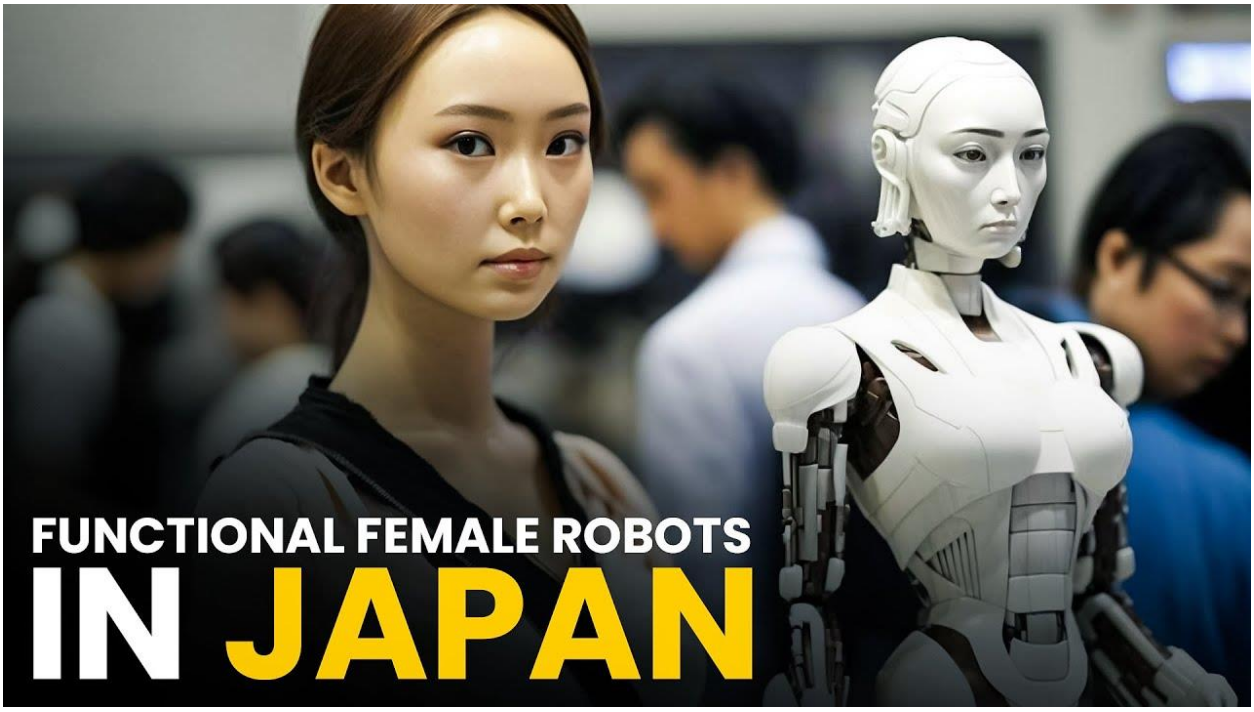
Here is another AI robot fashion model that looks human:

Here are Julius Caesar and Queen Cleopatra created by artificial intelligence:

The next image is a robot computer programmer in 2030:

Here is a female robot warrior created by artificial intelligence:

The next image shows a new Japanese robot:



Here is how a robot fashion model is finished:

Next are robot fashion models who are not people but AI creations:

Here is an image of another robot fashion model:

Next are two Japanese robot fashion models:

Next is Fedha, who is a TV news host in Kuwait created by artificial intelligence:

The next robot is Nadine, who is now a receptionist in Singapore:

This is Japanese robot Chihira being interviewed at a trade show:

Next is an AI image of Jia, a new Japanese robot receptionist:

Here is a realistic Chinese robot amazing people in a shopping mall:

This is Erica, a Japanese television news anchor controlled by artificial intelligence:

The following image shows a female robot soldier from around 2050:

Next is a more human looking male robot soldier, also from 2050:

Here is a male robot warrior from 2050:

The next picture shows a robot speaking at the United Nations in 2024:

The next image shows a British female robot television news anchor created by artificial intelligence:

Here are two more robots who are news anchors:

Next is Zae-An, a new Chinese news anchor controlled by artificial intelligence:

Here is a male TV anchor from China:

Next is Chinese robot Yang Nan standing next to her creator:

The first teaching robot looks like a human female and is from China. She teaches grade school:

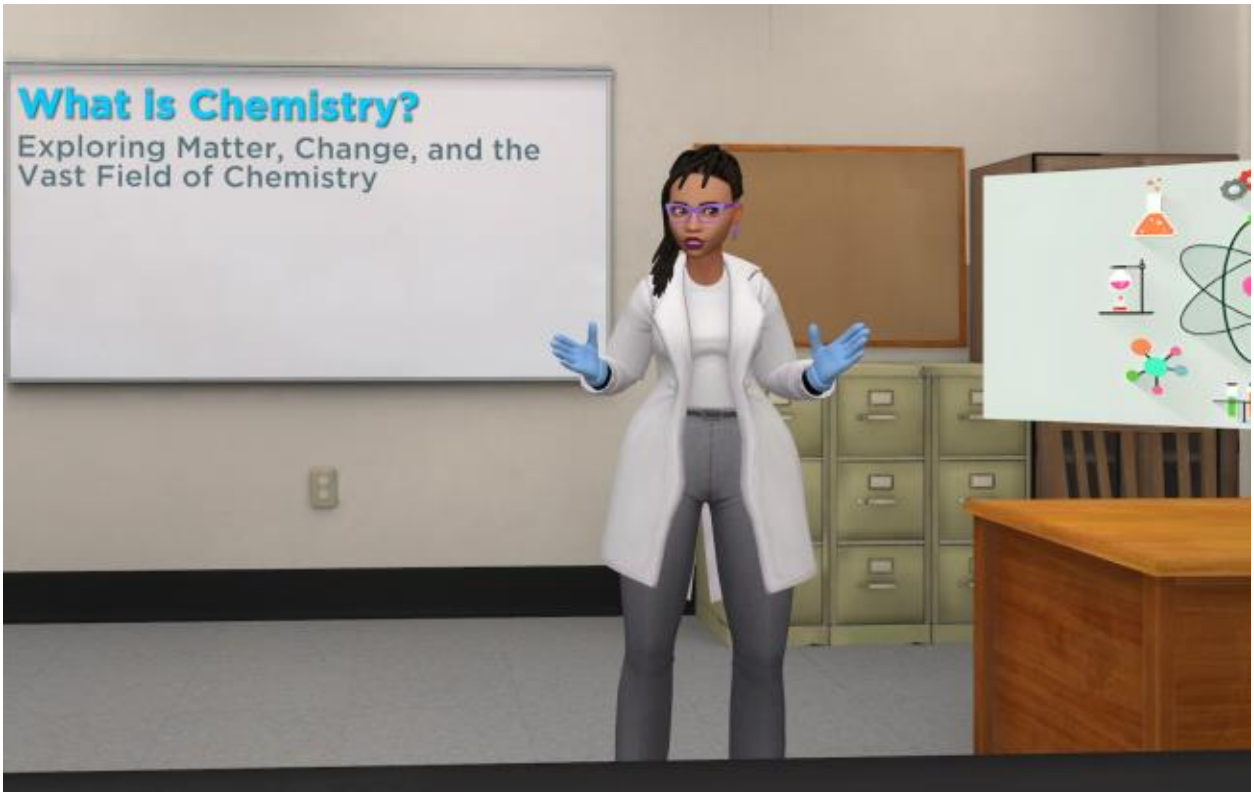
The second robot teacher is from England who looks like a real teacher:

This robot teaches physics:

The following AI image shows a new robot schoolteacher from India who is teaching today in 2024:

The next image is a similar robot teacher from Japan also available in 2024:

Next is a robot from Europe who can teach chemistry:



This is a Japanese robot who teaches Buddhism in Kyoto:

The next image is also a female who teaches high school:

Teaching robots and artificial intelligence electronic textbooks will soon be normal parts of the educational process from kindergarten through graduate school.

Artificial intelligence can help professors collect data, collaborate with other professors in many universities, produce high-quality illustrations for books and technical papers, and even teach courses using avatars, or replicas of human faces and voices. If the avatars are trained in the materials of the course, they can even have conversations with students and answer questions.

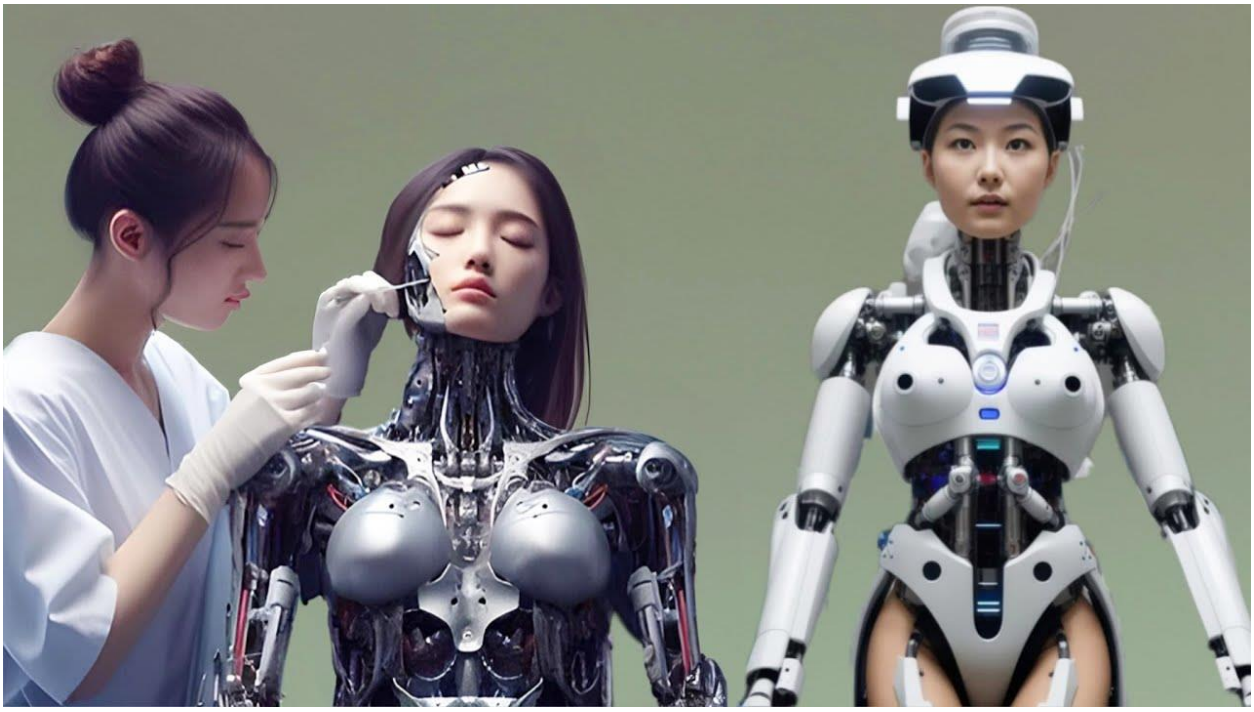
Artificial intelligence avatars can create lectures on almost every topic and can also deliver the lectures. College professors who use AI for creating lectures could either use their own faces or voices, or they could create lectures with AI-generated faces and voices.

Next is a future robot farm worker by 2050:

Here are robots raking and weeding in 2050:

Next is a robot waitress serving coffee:

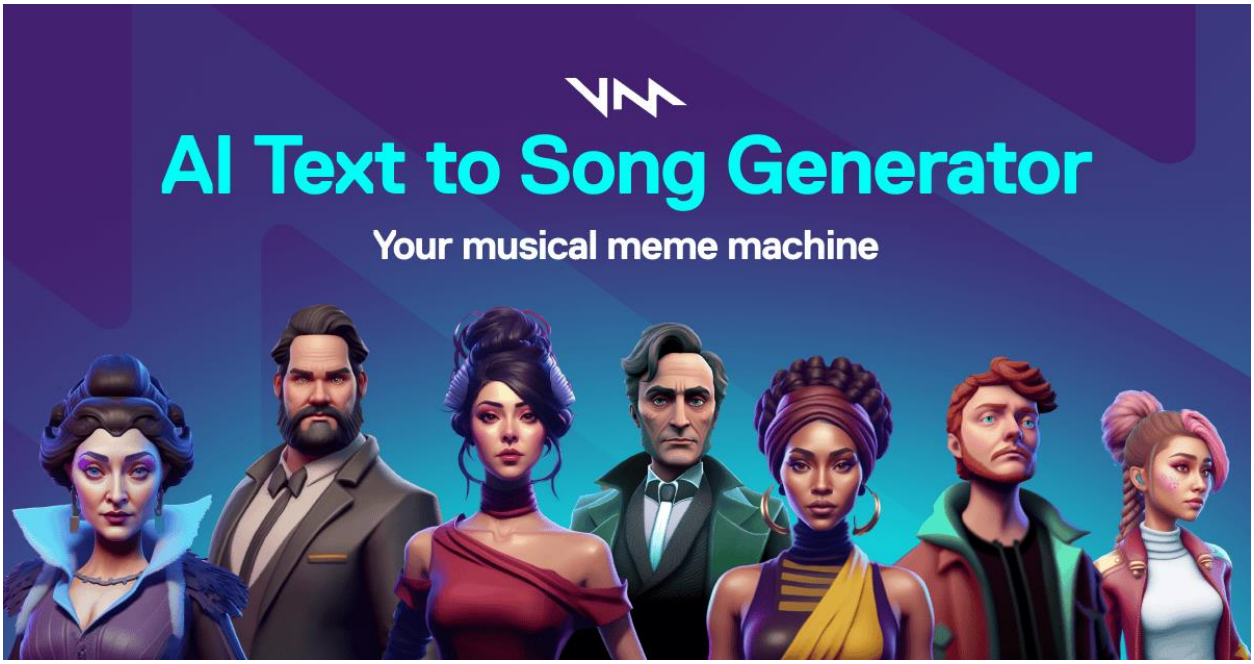
Here are two Japanese robots being prepared for a fashion show:



Next is an image of a future robot musician:

Here is a female robot singer:

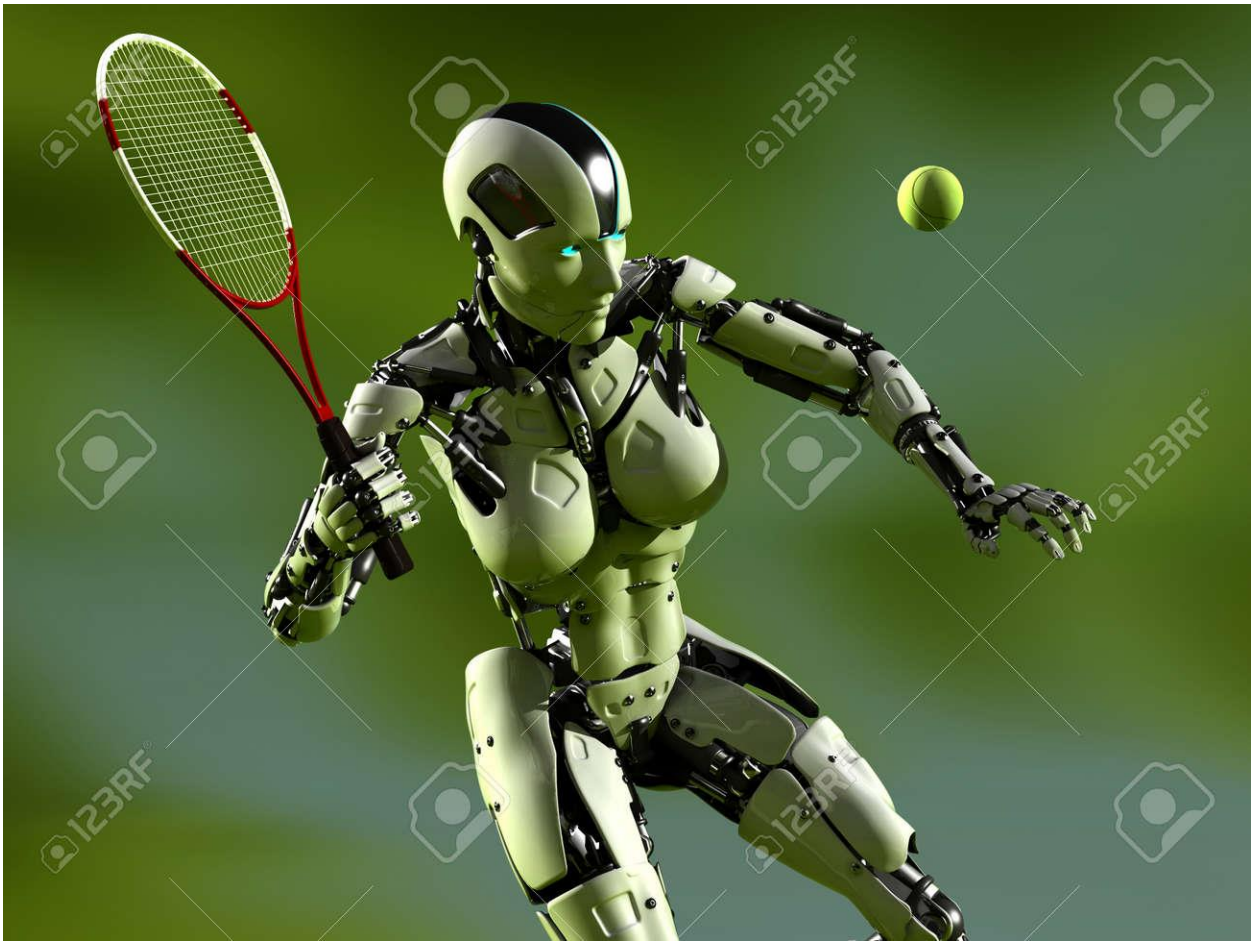
Japanese artificial intelligence tools can create new music:



This is the robot Ai-Dah who spoke to the British Parliament in 2024:

Here is an opera called “Scary Beauty” composed and performed by artificial intelligence:

Soon humans in tennis tournaments will compete against robots:



Here is a robot golfer in Colorado in 2050:

The next image shows two elderly college professors who are about to be laid off due to artificial intelligence:

The next image shows laid-off workers due to artificial intelligence:

The final image of people at risk shows a robot soldier parachuting in 2030:

Artificial intelligence is beneficial, but also dangerous!

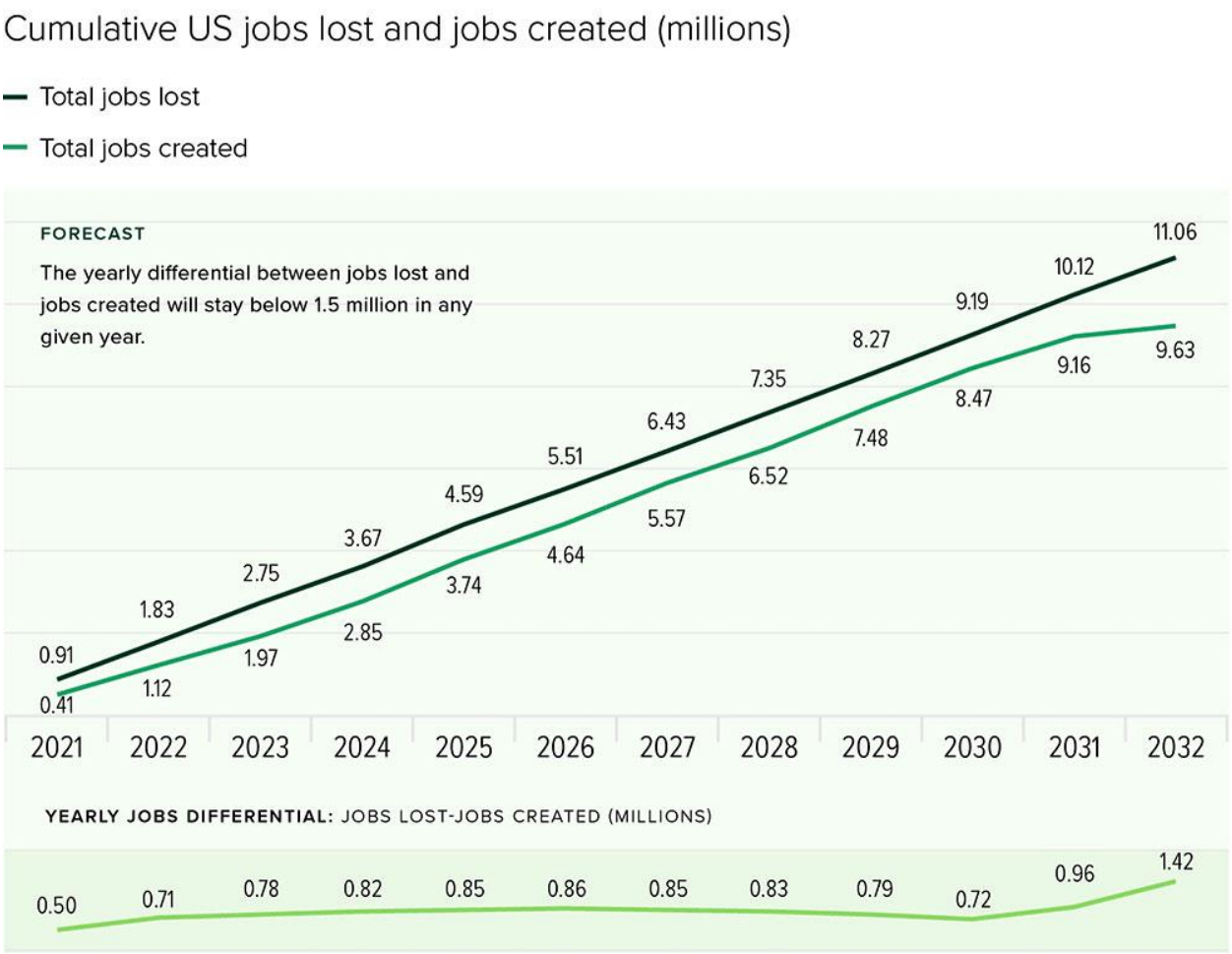
AMERICAN JOBS THREATENED BY ARTIFICIAL INTELLIGENCE

2024 U.S. Employment = 165 million; threatened by AI = 105 million

1. Accountants
2. Advertising workers
3. Artists
4. Authors of fiction books
5. Assembly line workers
6. Banking back-office personnel
7. Clerical workers
8. College administrators
9. College professors
10. Computer game designers without AI
11. Consultants without AI support
12. Customer support personnel
13. Drivers of long-range trucks that do not have to unload vehicles
14. Editors of books and magazines
15. Engineers: civil, electrical etc.
16. Financial workers
17. Free-lance writers
18. Function point counting specialists
19. Government workers in junior positions
20. High-school teachers
21. Hotel clerks
22. Interior decorators
23. Illustrators
24. Limo drivers
25. Literary agents
26. Magazine production personnel
27. Marketing personnel
28. Music composers
29. Musicians who record music
30. Paralegals
31. Pilots and/or copilots
32. Publishers: books, magazines
33. Reservation clerks
34. Retail clerks
35. Secretaries
36. Software engineers on business applications
37. Software out-source companies and personnel
38. Software maintenance programmers
39. Software technical writers
40. Space pilots

41. Taxi drivers
42. TV and movie production personnel
43. Technical writers on engineering
44. Teachers
45. Webmasters

Next is a graph from Forrester Research of probable job losses due to AI:



AMERICAN JOBS THAT CANNOT BE DONE BY ARTIFICIAL INTELLIGENCE

The major jobs dealing with information that cannot be done by artificial intelligence are those of elected officials, because votes can only be cast for humans and not for computer avatars.

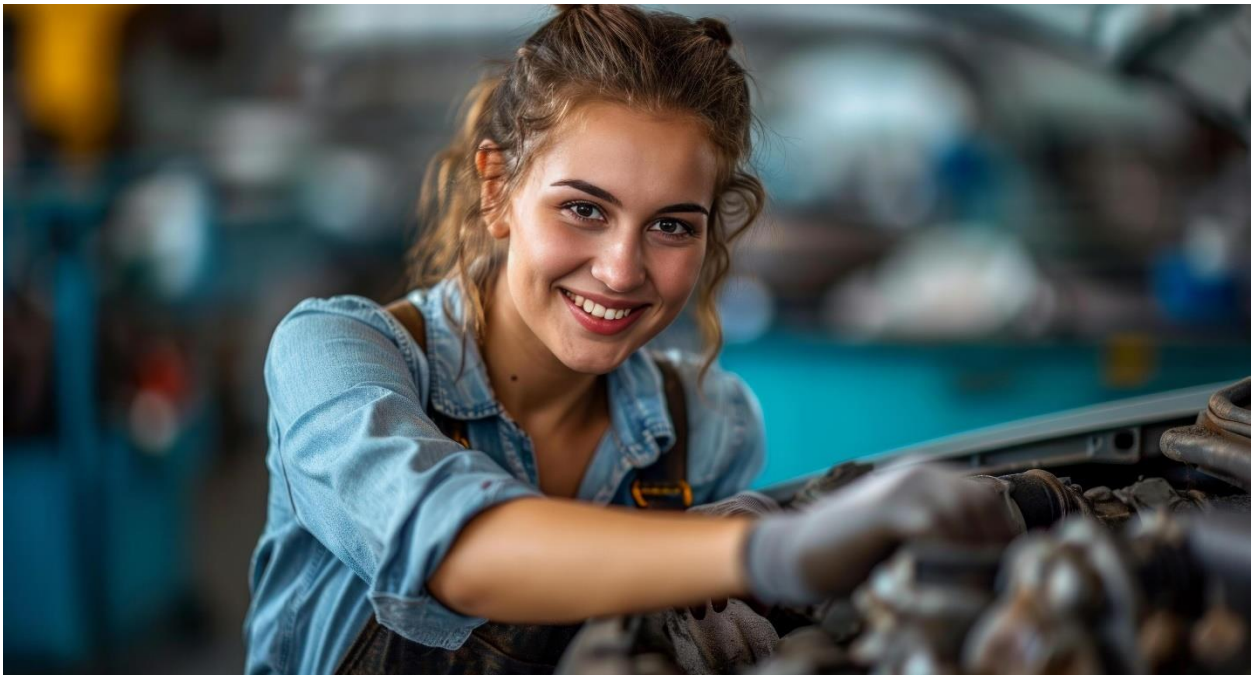
There are other jobs that probably will not be replaced by artificial intelligence due to custom, such as priests, ministers, and rabbis.

It is unlikely that municipal, state, or Federal judges would be replaced even though they deal with information.

Next is an AI image of a carpenter, whose job cannot be done by artificial intelligence:

Here are two woodworkers, who must still be humans:

Next is an auto mechanic, who has to be a human in 2024:



People who work with tools cannot be replaced by artificial intelligence. People who work with information are at risk.

The following list identifies major categories that are safe:

2024 U.S. Employment = 165 million; unthreatened = 55 million

1. Actors and actresses in live theater
2. Attorneys
3. Audiologists and hearing-aid consultants
4. Authors who use AI
5. Carpenters
6. Coast Guard personnel
7. Cyber security experts: assisted by AI.
8. Chefs
9. City and county jobs that are union members
10. Computer game designers using AI
11. Computer maintenance personnel on legacy software
12. Cruise line staff
13. Cruise line engineers and machine room personnel
14. Company owners
15. Construction workers
16. Consultants with AI support
17. Delivery drivers who need to hand-carry packages.
18. Dentists
19. Dental hygiene workers
20. Elected officials: city, county, State, and Federal
21. Electricians
22. Electric power repairs
23. Farmers
24. Film and TV actors and actresses
25. Film and TV directors and editors
26. Firemen
27. Flight attendants
28. Front office personnel in hotels, government offices, etc.
29. Government workers in executive positions
30. Government agencies such as the CIA, FBI, Internal Revenue, etc.
31. Journalists: who are famous with large reader bases
32. Judges: local, state, Federal, Supreme Court
33. Laborers
34. Lifeguards at beaches and pools
35. Magazine reporters.
36. Maintenance personnel: buildings, roads, etc.
37. Mechanics
38. Medical and dental personnel
39. Meteorologists
40. Military officers

41. Military personnel
42. Movie and television gaffers
43. Musicians: live performers
44. National-park rangers
45. Newspaper reporters
46. Nursing aids
47. Plumbers
48. Police
49. Postal workers
50. Prison guards
51. Real Estate agents
52. Reporters for television and major newspapers
53. Road repair personnel
54. Software architects and design personnel on AI projects
55. Software development and maintenance engineers on AI projects.
56. Special forces for secret military operations.
57. Sports: football, golf, baseball, basketball, tennis, players and coaches, etc.
58. State-park rangers and personnel
59. Tax collectors
60. Television news staff
61. Truck drivers who unload goods and boxes.
62. Undertakers
63. Union members whose contracts prohibit AI replacement.
64. Veterinarians
65. Waiters and waitresses

Florida and Sarasota Government Jobs that Can be Replaced by Artificial Intelligence

In 2024 Florida has about 11 million employed workers. As many as 7 million of these workers could be replaced by artificial intelligence within 10 years.

Sarasota has about 3,600 workers. By 2027 about 2,000 could be replaced by artificial intelligence. The only jobs that cannot be replaced are elected officials and people who use tools such as mechanics. Also. people who need to move or drive such as police and firemen cannot be replaced by artificial intelligence. All jobs that deal only with information are at risk: receptionists, clerks, and even low-level software engineers since artificial intelligence can now build software systems.

So far nothing has been published about the dangers of artificial intelligence replacing government workers. But since AI job losses could start as early as 2024, now is the time to begin planning for the next few years.

Unless the Sarasota Commissioners and the Sarasota city government move quickly, this is what a Sarasota government office will look like in 2050:

The State of Florida and Sarasota County and the City should immediately form study groups that use local computer science faculty as consultants, in order to plan ahead before the job losses actually start to happen, which could be before the end of 2024.

Legally only humans can run for office so AI cannot replace elected officials, although it might be that AI could do better than some. Also, artificial intelligence cannot be bribed, or threatened or coerced although computer programmers can be bribed and threatened. However, computer programmers can also hack into the bank accounts of those who threaten them, so that is not a wise option.

Jobs that Cannot be Performed by Artificial Intelligence in 2024

Following are sample illustrations created by artificial intelligence of jobs that AI cannot do.

First is an image of a hospital nurse in 2024:

Next is a possible robot nurse in 2030:

The next image is a cabinet maker from FreePic:

Next is a picture of a policewoman created with artificial intelligence and available from FreePic:

Next is a picture of a woman combat soldier:

Following is a male soldier created by artificial intelligence:

The next picture shows an ambulance paramedic crew member image by AI:

The next illustration shows firemen hosing a blaze:

Following is a U.S. Army General, whose image is created by artificial intelligence, but who must be a human:

The next image shows Florida Governor de Santis created by artificial intelligence. Elected officials cannot be replaced because votes can only be cast for humans, and not for machines.

The final illustration is Sam Altman of Open AI testifying to Congress about the impact of AI on America:

Jobs that cannot be done by artificial intelligence require outside movement, use of tools, or jobs that are protected by legal or union regulations. Elected officials cannot be replaced by AI because only humans can be entered onto election ballots.

It is fortunate for politicians that they cannot be replaced by artificial intelligence, because AI does a better job in decision making than many live politicians.

In the future, competent elected officials, and regular government workers, will use AI tools to examine the pros and cons of complex topics.

As recent examples of how AI might help, any reader who uses Google Bard or another AI tool should ask basic questions such as "what will be the impact of large new hotels on Siesta Key winter traffic." Or questions about solutions, such as "what can be done to improve winter traffic on Siesta Key?"

The University of Florida now requires that all students take at least one course in artificial intelligence, no matter what they major in. This was a wise decision by the University administration.

Unless government workers learn to use artificial intelligence, they are at risk of being replaced by artificial intelligence.

For Florida and Sarasota, government workers need to be taught how to use artificial intelligence for their jobs. Also, unions such as the American Federation of Government Employees need to seek protective legislation to avoid jobs being replaced by artificial intelligence.

For older government workers who need to learn about AI to use it in their jobs, either local universities or local computer associations can provide live courses and Zoom courses. In Sarasota the Sarasota Technology Users Group has many retired computer professionals who might help. There are similar computer associations in most cities in Florida and throughout the United States.

This is the start of 2024. Every year more people will be at risk of losing jobs unless government, corporations, and international organizations work together to plan how artificial intelligence can be integrated into the American work force without putting millions of workers out of jobs.

The next section discusses new jobs that artificial intelligence can create, but they are less than 10% of the jobs that will be lost.

New kinds of jobs that will be created due to artificial intelligence

2024 U.S. Employment = 165 million; new kinds of jobs = 10 million

1. AI assisted cyber-security experts.
2. AI assisted movie and television production personnel.
3. AI assisted home security specialists.
4. AI assisted bankers and financial planners.
5. AI assisted librarians in major libraries.
6. AI assisted military planning personnel.
7. AI assisted medical and hospital staff.
8. AI assisted Federal and State investigative bureaus.
9. AI assisted paralegals.
10. AI assisted traffic control personnel.
11. AI assisted commercial artists.
12. AI assisted musical composers.
13. AI assisted military planning specialists.
14. AI assisted home and office building construction crews.
15. AI assisted secret service and protection details for high-level officials.
16. AI assisted scientists and researchers in all fields.
17. AI assisted State and local government agencies.
18. AI assisted tax collection agencies at all levels.
19. AI assisted telephone personnel.
20. AI assisted television production crews.

The next picture shows Federal judges, who cannot be replaced by artificial intelligence. It is not as clear about lawyers. Those who testify in court must be human, but a lot of legal research can be taken over by AI tools This judge is not real, but an image created by artificial intelligence:

Next is an AI picture of a judge in a federal court room. AI will be used for background information and for examining records from similar cases, but not for replacing attorneys or judges. However, court reporter will probably use AI for continuous monitoring of comments and issues:

Artificial intelligence will have a major impact on U.S. and global jobs, and current data indicates that more jobs may be lost than new jobs created.

Hopefully economists, political leaders, and AI computer experts can work together to ensure continued high employment of humans, in spite of the power of artificial intelligence in handling information faster and sometimes better than people can.

RECENT REPORTS AND ARTICLES ON ARTIFICIAL INTELLIGENCE

Five Ways Artificial Intelligence will Change the World	NBC News 2023
The Future of AI's Impact on Society	MIT Technology Review 2023
How Will AI Impact the Future of Work	Forbes 2023
Artificial Intelligence News	Science Daily 2023
Artificial Intelligence (AI) Technology	The Guardian 2023
Artificial Intelligence	BBC News 2023

BOOKS ABOUT ARTIFICIAL INTELLIGENCE

The McGraw Hill Illustrated Encyclopedia of Robotics and Artificial Intelligence, McGraw Hill 2022.

Fundamental of Artificial Intelligence: Problem Solving and Automated Reasoning; Miroslav Kubert, McGraw Hill, 2023

The Essence of Artificial Intelligence; Alison Crowly, Prentice Hall; 2023

Philosophy & Artificial Intelligence; Todd C. Moody; Prentice Hall 2023

Artificial Intelligence: A Modern Approach; Stuart Russel and Peter Norvig; Pearson; 2022

Readings on Changes Caused by New Technologies

Starr, Paul; The Social Transformation of American Medicine; Basic Books; Perseus Group; 1982; ISBN 0-465-07834-2. **NOTE: This book won a Pulitzer Prize in 1982 and is highly recommended as a guide for improving both professional education and professional status. There is much of value for the software community.**

Strassmann, Paul; Information Payoff; Information Economics Press, Stamford, Ct; 1985.

Strassmann, Paul; Governance of Information Management: The Concept of an Information Constitution; 2nd edition; (eBook); Information Economics Press, Stamford, Ct; 2004.

Strassmann, Paul; Information Productivity; Information Economics Press, Stamford, Ct; 1999.

Weinberg, Gerald M.; The Psychology of Computer Programming; Van Nostrand Reinhold, New York; 1971; ISBN 0-442-29264-3; 288 pages.

Weinberg, Gerald M; Becoming a Technical Leader; Dorset House; New York; 1986; ISBN 0-932633-02-1; 284 pages.

Yourdon, Ed; Death March - The Complete Software Developer's Guide to Surviving "Mission Impossible" Projects; Prentice Hall PTR, Upper Saddle River, NJ; ISBN 0-13-748310-4; 1997; 218 pages.

10 SAMPLES OF PUBLISHED BOOKS BY CAPERS JONES 1978 to 2023

NOTE: a new book by Capers Jones on Artificial Intelligence is planned for publication in 2024. It will be about 300 pages in length and have about 300 AI-generated illustrations. Capers Jones published 20 books between 1978 and 2023.

1. Software Development Patterns and Anti-Patterns; Taylor Francis, 2022

2. Software Assessments, Benchmarks, and Best Practices; Addison Wesley Longman, Boston, Ma; 2000

3. The Year 2000 Software Problem, Addison Wesley Longman, Boston, MA; 1998.

4. Software Quality – Analysis and Guidelines for Success (International Thomson Computer Press; Boston, MA; 1997).

5. Patterns of Software System Failure and Success; International Thomson Computer Press: Boston, MA; 1995).

6. Assessment and Control of Software Risks; Prentice Hall, Englewood Cliffs, NJ; 1994.

7. Applied Software Measurement; McGraw Hill, 1991

8. Programming Productivity: Steps Toward a Science; Prentice Hall, 1993

9. Software Quality Today; IBM Corporation; 1978

10. Software Engineering Best Practices; IBM Corporation 1978

10 SAMPLES OF JOURNAL ARTICLES BY CAPERS JONES 1978 TO 2023

Capers Jones has published more than 250 journal articles between 1978 and 2023 in magazines such as Scientific American, IBM Systems Journal, Datamation, Crosstalk, IEEE Transactions on Software Engineering, Cutter Software Journal, and others. This list primarily shows a sample of articles about risks.

1. "High Efficiency Defect Removal Efficiency"; IEEE Software; August 2019

2. "Challenges of Software Project Management"; IEEE Computer; June 2017"

3. "Corporate Software Risk Reduction"; ITT Journal; August 2016

4. "Defenses Against Software Litigation"; IEEE Computer; March 2015

5. "Quality Control for Embedded Software"; IEEE Computer, May 2009.

6. "Preventing Software Failure: Problems Noted in Breach of Contract Lawsuits"; U.S. Air Force software journal *Crosstalk*, June 2008.

7. "Software Defect Potentials"; Crosstalk, Air Force Technology Support Center; December 2007

8. "The Evolution of Defense Software"; *Crosstalk*; Air Force Technology Support Center; November 2004

9. "Conflict and Litigation between Software Clients and Developers"; IEEE Computer; April 2001.

10. "Analysis of Damages due to the Y2K Problem"; IEEE Software; December 2000.

25 SAMPLES CAPERS JONES' GOVERNMENT CLIENTS FOR RISK CONSULTING

The author was an international risk consultant for IBM and his own company Namcook Analytics. He has consulted about risks with over 60 government agencies at International, Federal, and State levels. He has consulted with about 95 corporations such as Apple, AT&T, Ford, General Motors, and Microsoft. A sample of 25 government agencies is shown here:

1. Atomic Energy Commission (AEC)
2. Civil Service Commission
3. Department of Defense (DoD)
4. Homeland Security
5. Internal Revenue Service (IRS)
6. National Aeronautics and Space Administration (NASA)
7. National Security Agency (NSA)
8. Office of the Surgeon General
9. U.S. Airforce
10. U.S. Navy
11. Government of Canada
12. Government of Hong Kong
13. Government of Japan
14. Government of Malaysia
15. Government of Singapore
16. Government of South Korea
17. Government of Quebec
18. Government of Thailand
19. State of California
20. State of Florida
21. State of New York
22. State of Oregon
23. State of Pennsylvania
24. State of Rhode Island
25. State of South Carolina

25 SAMPLES OF CAPERS JONES CORPORATE AND ACADEMIC CLIENTS

The author has consulted about risks with about 95 corporations and universities. This sample shows only 25 corporations and universities.

1. American Airlines
2. Amdahl
3. American Express
4. Apple
5. AT&T
6. Bank of America
7. Boeing
8. Dunn & Bradstreet
9. Dupont
10. Ford
11. General Motors
12. Grumman
13. Hartford Insurance
14. Harvard University
15. IBM
16. McKinsey Consulting
17. Microsoft
18. MIT
19. Mobil Oil
20. Nippon Electric
21. Raytheon
22. Walt Disney
23. Wells Fargo
24. Westinghouse
25. Xerox

End of Document.