Technology and the future of jobs

1 Warmer

a. Discuss the following questions.

1. Many people worry that AI and other types of technology will replace almost all jobs in the not-too-distant future. To what extent do you think this is true?
2. What effects, if any, will technology take over jobs in your field?
3. In your opinion, are there human skills that cannot be replaced by technology? If so, what are some of those skills, and in what fields will they continue to be important?

2 Key words

a. Choose the key words that match the definitions. The paragraph numbers are in parentheses to help you find the words quickly. Check your answers and your understanding of how the words are used by using the same word to complete the example sentence immediately after each definition. Then read the complete article to see how each of the words is used in context.

safe bet (1)	hyped roles (8)	sift through (15)
STEM (2)	sought after (10)	heavy lifting (16)
augmented (3)	scarcity (10)	mind-boggling (17)
age-old needs (3)	contextual understanding (13)	envision (18)
harness (6)	summit (13)	commonplace (18)

1. _____: basic human requirements or problems that have always existed and that may or may not be helped by new technologies

   Health care and good nutrition are examples of _____.

2. _____: extremely surprising or difficult to believe or understand

   The incredible abilities of Olympic athletes are _____.

3. _____: to study large amounts of information carefully to identify useful or important points

   We need to _____ *the data very carefully to make sure we're arriving at the correct conclusions.*

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4. _____: an acronym referring to academic and professional fields in science, technology, engineering and mathematics

   _____ *jobs are predicted to increase in number over the next few years.*

5. _____: a lack of something that is needed or wanted

   One of the biggest problems in dry areas is the _____ *of drinking water.*

6. _____: jobs, positions or responsibilities that create a large amount of publicity or excitement, often beyond what can realistically be expected

   Some of the most _____ *are jobs in AI.*

7. _____: to imagine something that doesn't yet exist or that hasn't happened

   Can you _____ *a future without human workers?*

8. _____: improved by adding new capabilities or features, especially in the area of technology; can refer to the expansion of human capabilities through technology

   _____ *reality is a technology that adds digitally-created elements to real scenes or situations.*

9. _____: the ability to understand and analyze information by considering situations, feelings or circumstances beyond just the facts

   Machines may never have the _____ *of people's feelings and situations that humans have.*

10. _____: something that has become normal and familiar because it occurs very frequently

    Seeing people using their watches to talk on the phone is now _____.

11. _____: something you can rely on; a decision or an investment that will probably be successful and is not very risky

    I think investing in government bonds is probably a(n) _____.

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12. _____: a meeting where leaders or experts get together to share information, make decisions and discuss important issues; often used in the contexts of business or government

    Every year, there is a large _____ in Davos, Switzerland where world leaders, businesspeople and economists meet to discuss global economic issues.

13. _____: in very high demand, used to refer to certain types of people or products

    People who can write good AI instructions are very _____ by AI developers.

14. _____: to control and use energy, resources or power in order to achieve specific goals

    Renewable energy systems _____ the power of wind, water or the sun to create electricity.

15. _____: the most difficult or time-consuming parts of a job or project, often related to the compilation or interpretation of data

    Our company has computer programs that do the _____ of producing our yearly financial reports.

‘Expectations will shift dramatically’: tech jobs move from science fiction to fact

ROLES IN CUTTING-EDGE SCIENCE AND AI WILL GROW IN DEMAND, BUT TECH WILL TRANSFORM ALL JOBS

BY CRISTINA CRIDDLE AND CLIVE COOKSON

1 Jobseekers often look to roles in science, technology, engineering and mathematics as safe bets.

2 Under almost every 10-year scenario modelled by labour economists, they are correct to do so. Projections from the US Bureau of Labor Statistics, released in September, show an 11 per cent rise in so-called “Stem” employment, to 11.5mn, by 2032, while the number of non-Stem jobs will increase by just 2 per cent.

3 These will not necessarily be the jobs of science fiction. Many roles created from developments in technology will be augmented versions of those that already exist, or new roles serving age-old needs in areas such as healthcare, basic infrastructure, or public services.

4 Wind turbine technician is the hottest role on the BLS list, with projected employment growth of 44.9 per cent from 2022 to 2032, followed closely by nurse technicians, with predicted 44.5 per cent growth. Demand for IT roles such as data scientists, information security analysts and software developers will surge by more than 25 per cent.

5 Artificial intelligence, already transforming work across many sectors, will have an especially “huge impact” in fields of advanced science, says Adrian Smith, president of Britain’s national academy of sciences, the Royal Society.

6 Scientists will be able to harness computer power and sophisticated instruments to generate and analyse huge quantities of data and more advanced, sophisticated hypotheses.

7 “Being part of a team handling vast amounts of data requires a different set of skills to the individual with their own instrument,” Smith says. “The collection and processing of data will be at the heart of science — and increasingly it will involve the use of clever AI algorithms.”

8 Among the most hyped roles working with AI are prompt engineers. Specialised in large language models and coding, they understand how to command AI to perform tasks or create particular outcomes. And although experts are divided over the need for them in the distant future, most agree demand will increase over the next few years.

9 Talent site Upwork found searches for “prompt engineering” began increasing from April last year, about six months after ChatGPT was released. Between the fourth quarter of 2022 and the second quarter of 2023, it recorded a 1,500 per cent increase in generative AI-related search results.

10 “Supervising jobs are going to be more and more sought after, and there is a huge scarcity [of workers],” Adam Niewinski, managing partner at venture capital firm OTB Ventures, says. “There is a special skill set needed for this. It is a very tough logic that you need to follow.”

11 A growing awareness of AI’s flaws, such its tendency to state inaccuracies as fact or carry algorithmic bias, also demands a range of critical, regulatory and creative skills.

12 Teodora Danilovic is a prompt engineer at start-up AutogenAI, which uses AI to help businesses write bids for contracts. She says human, rather than technical skills, will be valued to oversee and check AI work.

13 “We have the contextual understanding… the understanding of bias, we have the creativity, the emotional intelligence,” she told the FT’s AI summit last year. “We are able to think of unknown unknowns…The AI is very limited in the sense that it can only work on what it’s been trained on.”

14 AI and other developments are also transforming jobs in white-collar work such as consulting, compliance or law.

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15 Frank Diana, a futurist and partner at Tata Consultancy Services, is exploiting AI's ability to quickly process big data and catch signals invisible to humans. When a client recently asked TCS to report on how remote work would affect transport use, for example, the consultancy posed the question to AI, then human analysts sifted through what it found.

16 "AI performs some of the heavy lifting, the human in the loop is able to apply some of their critical-thinking abilities," he says. "It primarily was a massive time-saver."

17 Digital twins — virtual copies of objects, structures or environments that can be used to simulate scenarios that could then apply to the real world — can be applied in a mind-boggling range of fields, says Diana, shaking up roles from urban planning to individualised drug discovery.

18 Another hot area will be virtual and augmented reality. Apple and Meta, which have both launched headset devices, envision mixed reality, or XR, becoming commonplace in interactions from socialising in virtual spaces, to watching concerts and holding work meetings.

19 Skills required to design such experiences have traditionally been concentrated in the games industry, and are already in high demand.

20 "Over the past few years, there has been a talent raid on the games sector, with everything from architecture and manufacturing through to XR companies competing for graduates who come from games," says Professor James Bennett, director at StoryFutures, a Royal Holloway project centred around training programmes for emerging technologies.

21 Its research found a lack of experience and technical skills among immersive workers. Shortages are in part due to the rapid acceleration of the sector, says Bennett. "There's a decent amount of graduates and people enrolling in courses if the games industry was static, but the games industry is growing, the metaverse sector is exploding."

22 Chris Marotta, design principal at global digital product studio Ustwo, compares the boom to the smartphone design's effect on digital experiences.

23 "If you're interested in designing the future of how we interact, both with each other and with computers, this area is the place to do it because expectations will shift dramatically."

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3 Understanding the article

a. Choose the correct option to answer each question according to the information in the article. You may have to infer some of the answers.

1. What can be inferred from studies by labour economists?

   a. STEM jobs will continue to increase faster than non-STEM jobs.

   b. By 2032, almost all new jobs will be in STEM fields.

   c. People working in non-STEM jobs will lose their jobs in the near future.

2. According to the article, what types of jobs will many future tech jobs be?

   a. New jobs that don't exist today

   b. Jobs based on current or past science fiction

   c. Versions of existing jobs or new jobs that serve traditional needs

3. In what area(s) of IT will the number of jobs increase by one quarter from what it is now?

   a. Data scientists, information security analysts, and software developers

   b. Nurse technicians

   c. Wind turbine technicians

4. What do prompt engineers do?

   a. Create new large language models

   b. Write clear, precise instructions for AI in order to elicit specific results

   c. Write programs for the use of AI in engineering

5. According to a prompt engineer, what skills does AI not have?

   a. It still can't process data quickly enough.

   b. It can only do what it has been trained to do.

   c. It can't perform complex tasks.

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6. How did humans and AI work together to produce a report on how remote work would affect transport use?

   a. AI produced a list of questions for the humans to consider.

   b. Humans asked the question and AI did all of the research and analysis of the results.

   c. AI produced data and humans analyzed it

7. What are 'digital twins'?

   a. Virtual simulations of real-world situations or objects to help predict outcomes

   b. Exact physical replicas of objects

   c. Robots that are 'twins' of human workers and can do everything humans can do and more

8. What can be inferred from the "talent raid" on the games industry?

   a. The games industry is shrinking and hiring fewer people.

   b. People in the games industry have skills that are valuable in other tech industries.

   c. Only people in the games industry have the skills to work with virtual and augmented realities.

9. What does the comment about graduate numbers in paragraph 21 suggest?

   a. There are too many graduates in gaming technology because the games industry isn't growing.

   b. Students are not training in areas related to the games industry.

   c. There is a shortage of trained workers because of the rapid expansion of uses for virtual and augmented reality.

10. What does the comparison of smartphone design and AR/XR technology imply?

    a. AR/XR technology will have a similar impact on how humans interact with technology.

    b. Smartphones had a bigger impact in life and in business than AR/XR will.

    c. AR/XR technology will probably soon be replaced by something completely different.

4 Business language – trends in employment

a. Complete the sentences from the article with the words in the box. Then scan the article to check your answers.

venture capital firm	bids	talent site
large language models	prompt engineers	talent raid
compliance	algorithmic bias	
immersive workers	metaverse sector	

1. A growing awareness of AI's flaws, such its tendency to state inaccuracies as fact or carry _____, also demands a range of critical, regulatory and creative skills.
2. 'There's a decent amount of graduates and people enrolling in courses if the games industry was static, but the games industry is growing, the _____ is exploding.'
3. Teodora Danilovic is a prompt engineer at start-up AutogenAI, which uses AI to help businesses write _____ for contracts.
4. Among the most hyped roles working with AI are _____.
5. AI and other developments are also transforming jobs in white-collar work such as consulting, _____ or law.
6. Its research found a lack of experience and technical skills among _____. Shortages are in part due to the rapid acceleration of the sector, says Bennett.
7. 'Supervising jobs are going to be more and more sought after, and there is a huge scarcity [of workers],' Adam Niewinski, managing partner at a(n) _____ OTB Ventures, says.
8. Specialised in _____ and coding, they understand how to command AI to perform tasks or create particular outcomes.
9. _____ Upwork found searches for 'prompt engineering' began increasing from April last year, about six months after ChatGPT was released.
10. 'Over the past few years, there has been a(n) _____ on the games sector, with everything from architecture and manufacturing through to XR companies competing for graduates who come from games,' says Professor James Bennett, director at StoryFutures, a Royal Holloway project centred around training programmes for emerging technologies.

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5 Discussion

a. Discuss these questions.

1. The article states that in the US, STEM-related jobs have increased more rapidly than non-STEM jobs, and this trend is expected to continue. This fact seems to support the idea that the best type of university degree to get would be within the fields of science, technology, engineering or mathematics. However, later in the article, there appears to be a slight contradiction of that idea. What opinions and information create that contradiction?

2. Based on the opinions and information in the article, if someone is not interested in a STEM degree, what other types of degrees or training might lead to job possibilities in the fields of technology and AI?

6 Wider business theme – The third industrial revolution and the future of jobs

a. Read the text and discuss the questions.

How Workers Have Adapted to Past Industrial Changes

Before the First Industrial Revolution, which started in the late 18th century, most people lived in rural areas and many worked in agriculture. With the invention of steam power and new machinery, many of those jobs disappeared, but new jobs were created as factories were built in cities. As a result, millions of rural workers moved to urban areas to find employment.

Many skilled artisans were also afraid that machines would replace their jobs, and in some cases, they were right—traditional crafts declined rapidly. However, new opportunities emerged for machine operators, mechanics, and engineers.

The Second Industrial Revolution, from the late 19th to the early 20th century, brought electricity, the telephone, and mass production. Office work became very important and created many jobs for secretaries, accountants, and managers. Factory work also expanded, and the automobile industry alone generated millions of new jobs.

What helped people adapt? Education was the key factor, and governments and businesses invested in training programs. As with any change, some people couldn't adapt, but there were many job opportunities for workers who learned new skills.

As we can see from the two previous industrial revolutions, technological advances create both winners and losers. Adaptation is possible, but it requires investment in education and a desire to learn new things. The question now is whether we can adapt to the third industrial revolution – the digital and information technology revolution that began in the 20th century and is continuing in the 21st century with quantum computing and AI.

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1. How did the population distribution change during the first industrial revolution and what kinds of jobs did it create? What social changes do you think took place during that time?

2. The text mentions the creation of office and factory jobs during the Second Industrial Revolution. What other types of jobs do you think were created during that time? What types of jobs do you think disappeared?

3. What industries related to the Second Industrial Revolution are there in your country? Is the number of jobs in those industries shrinking, expanding or staying the same?

b. Prepare a short report on the future of jobs in your country. Use information from the text from The Financial Times, and do research if necessary.

Report on the future of jobs in (name of country)

Section 1: A comparison between the US and your country of the projected increase in STEM jobs by 2032 (You can make a general statement about whether STEM jobs are increasing as quickly as they are in the US.).

Section 2: The main industries where AI and other new technologies are already having an effect on jobs, and what those effects are.

Section 3: Your ideas about how new technologies will affect other industries in the future (Choose two or three industries and make predictions.).

Section 4: A conclusion about whether you are generally optimistic or pessimistic about the future of jobs in the age of digital technology and AI.

Useful language

According to the article/statistics/researchers, …

In spite of the fact that …, we believe that …

In light of the changes in …, it is probable that …

In conclusion, we believe/feel/think that …

c. Present your report to the class. Discuss any differences of opinion among the reports.