CHAPTER V

HOW ARTIFICIAL INTELLIGENCE IS CHANGING THE JOB MARKET

Figure 5.1. Topics in Chapter V.

In this chapter, we'll explore the potential changes and challenges facing the job markets in the future as a direct result of the new technologies being created today.

Most of these changes will occur because of the proliferation of artificial intelligence technologies. They will impact our lives and societies in countless ways, as will the exponential growth of other technologies like nanotechnology, quantum computing, blockchain, biotechnology, the Internet of Things, virtual and augmented reality, and 3D printing.

As these tools are developed and adapted to work together, there will likely be dramatic and rapid changes, which society may or may not be fully prepared for.

It is nearly impossible to predict with any degree of certainty what our future will look like. In a report called *Megatrends 2017*, the Finnish Innovation Fund Sitra described the nature of work in the future, including two possible outcomes:

1. One possibility is that only relatively few people will be employed, and even fewer will reap the benefits of their work.

2. The other possibility is that the nature of work will change, but there will be plenty of paid work for everyone.{104}

While no one knows for sure what the future holds, the only certainty is that these technologies will bring change. While millions of jobs will likely be replaced by new kinds of automation, artificial intelligence and robotization, there is also great potential for new types of work opportunities to be created.

For this reason, we should begin to seriously consider this matter now, to better enable ourselves to proactively approach the technologies of the future.

In this chapter, you'll learn about some of the issues concerning people being displaced from their jobs due to a rise in robotic and automated technologies. You'll also discover which industries are currently growing, as well as some of the interesting AI-related jobs that will soon be

available.

Lastly, we'll take a look at the concept of a basic universal income, including the benefits and disadvantages associated with this idea.

41. How Many Jobs Will Be Lost Due to Automation and Robotic Technologies?

Perhaps one of the biggest questions that arises as AI technologies continue to develop is whether humans will be replaced in the workforce as robots become capable of doing the same tasks as traditional laborers.

In a widely-cited report called *The Future of Employment: How Susceptible are Jobs to Computerisation?,* Oxford researchers Carl Benedikt Frey and Michael A. Osborne indicate that up to 47 percent of U.S. workers will face the threat of losing their jobs to automated technologies over the next two decades. This was the first study of its kind to suggest that a large number of human workers could be replaced by robotics and AI technologies.{105}

A report called *A Future That Works: Automation, Employment, and Productivity*, based on a study by the McKinsey Global Institute, predicts that nearly half of our work tasks will be performed by some form of robot by the year 2055. Interestingly, this report focuses on specific tasks and activities that are likely to be automated, rather than on complete jobs.{106}

Another study done more recently by McKinsey estimates that between 400 and 800 million workers could lose their jobs to automated systems by the year 2030.{107}

Clearly, this will create a huge need for individuals to be able to learn new skills to enable them to take on different kinds of work. For this reason, it is important for governments to create retraining programs now, in addition to coming up with ways to help ease the financial burden so many will suffer due to losing their jobs. For example, governments could help by implementing supplemental income programs, such as basic universal income, which we'll discuss later in this chapter.

This period of transition is probably one of the toughest challenges we'll face in the near future as a result of the rapid changes in technology. It is an issue that will require proactive collaboration between countries, and between entities in the public and private sectors, as well as input from

experts in a variety of disciplines.

These changes may seem startling, but it is important to remember that every technological advance throughout history has generated new kinds of jobs that did not exist previously. It is always difficult to imagine all the ways that new technologies will change our current circumstances ahead of time. However in this scenario, it is very possible that the amount of jobs lost to AI and robots may outnumber the additional jobs created to sustain the new workflow.

We cannot predict the future with any certainty, but with the rapid technological developments and advancements currently taking place in companies worldwide, it is best to be prepared for the socioeconomic changes that may occur on a global scale.

42. Which Jobs Will Be Replaced by Robots First?

Want to know whether your job is likely to be filled by a robot in the next 5 to 10 years?

As AI technologies continue to grow and develop, many people are becoming increasingly concerned about the number and kinds of jobs in which robots are likely to replace human workers in the future. This is not an unfounded concern. In fact, it has never been more important to spread knowledge about the future of jobs than it is now, so that working people can have a chance to study and acquire new skill sets, preparing ahead of time for the upcoming changes in the workforce.

Taiwanese venture capitalist and technology executive Dr. Kai-Fu Lee is the founder of Sinovation Ventures, an early-stage venture capital firm that invests in many AI companies. One of the leading experts on the growth of artificial intelligence, he has developed a fascinating formula to help identify which jobs are most likely to be replaced by robots in the future, stating that:

“Every job which takes less than 5 seconds to think will be done by robots.”[{108}]

I am personally quite fond of this theory and find it to be a very helpful guideline. Take a few moments to consider your own job, and as you do, ask yourself which of your typical daily tasks you can perform without taking 5 seconds or longer to think about first. Could you acquire new skills that would allow you to perform more complex or creative tasks in place of these?

Martin Ford, author of *Rise of the Robots*, also highlights the fact that the kinds of tasks that are routine and repetitive will be the first to be assigned to robots, saying:

“I personally believe that, in the future, we could well get into a situation where jobs simply disappear. And it will be especially any kind of job that is routine or repetitive on some level. A lot of those jobs are going to disappear.”[{109}]

When discussing tasks that are automated or repetitive, most people tend to think first of low-income jobs. However, robots and AI technologies will be able to replace a lot of white-collar workers as well.

According to several experts in the field, jobs that require analysis of data and trends will also be among the first to be given to robots. This includes jobs in the healthcare and financial industries, both of which rely on analytics and trends.

There are already examples of white-collar jobs being lost to robotic technologies. In the financial field, the American investment bank Goldman Sachs Group, which once employed 600 traders in its New York office, now has the same tasks being performed by only two human traders and an array of AI tools.{110}

An additional change in the workforce that is likely to occur is within the transportation industry. Already, self-driving cars are beginning to replace traditional jobs like taxi driving. Over time, it will become increasingly more common to see vehicles of all kinds, including boats and delivery trucks, that do not require human drivers. The implementation of this technology will likely take some time, however.

Figure 5.2. illustrates 64 jobs that will likely be endangered by the new era of self-driving cars. This information was compiled by futurist Thomas Frey, who believes that as we begin to adopt self-driving cars, many more kinds of jobs may actually be replaced as well.

Figure 5.2. 64 Jobs That Will Disappear in the Self-Driving Car Era.

One helpful way of predicting which human jobs will probably be replaced by robotic workers is to consider which tasks require little use of basic human qualities like empathy, intuition, emotional intelligence, negotiation, complex communication, coaching, and creativity.

The McKinsey report suggests that one of the ways we can predict which kinds of jobs will be the first to be automated is by identifying those that involve physical labor in a predictable environment. Examples of these

kinds of positions might include assembly line, cleaning, or fast food jobs. {111}

Interested in learning whether your job is likely to become automated? Take a look at these tools:

- **Will Robots Take My Job?:** Simply type in an occupation and you can discover the probability, in the form of a percentage, of it being converted from human to robotic workers. The results shown are based on the report mentioned earlier by Frey and Osborne called *The Future of Employment: How Susceptible are Jobs to Computerisation?*{112} *https://willrobotstakemyjob.com*

- **Can a Robot Do Your Job?:** This tool, which was created by the Financial Times based on research conducted by McKinsey, is a helpful resource that focuses on specific tasks, rather than entire jobs, that are likely to be automated.{113} *https://ig.ft.com/can-a-robot-do-your-job*

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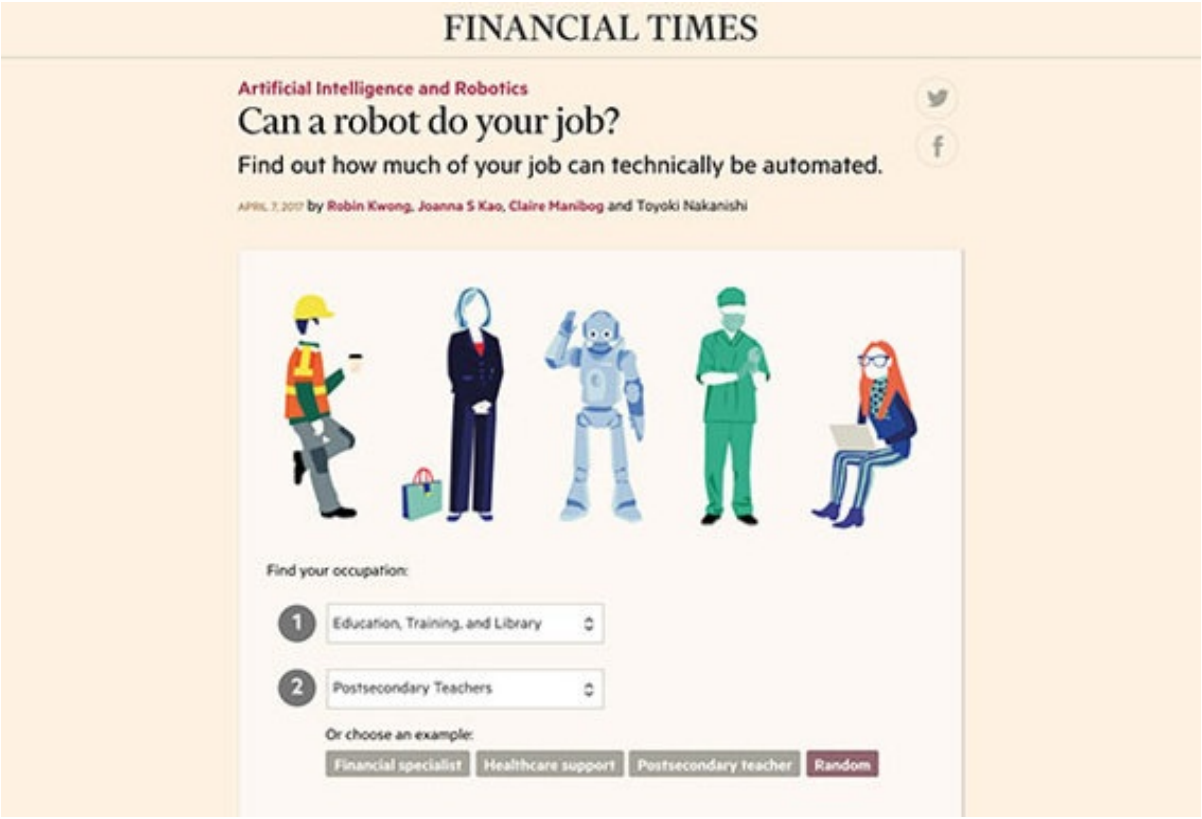

Figure 5.3. Can a Robot Do Your Job by Financial Times *at* *https://ig.ft.com/can-a-robot-do-your-job*

For example, if you were to select that you are a **postsecondary teacher**, the tool would show that 9 out of the 57 activities that you perform regularly could be done by a robot, while also listing the remaining 48 tasks that robots cannot currently perform, according to McKinsey's research.

These kinds of tools and studies can help us to transform our thought processes about the nature of work, while also aiding in the design of future tasks and opportunities that will be best suited to human workers.

43. Which Jobs Will Be Harder to Replace with Robotic Technologies?

As we have discussed in other sections, there are many jobs that will likely be replaced with AI technologies in the future. However, there are still many categories of work that robots are not well suited to perform.

A study by the Oxford Martin School grouped the jobs that are less likely to be replaced by robots into three basic categories, which are listed below with examples: 1. Jobs that Require Hands-on Manipulation • Oral Surgeons • Makeup Artists • Chiropractors • Firefighters

2. Jobs that Require Creativity

    • Choreographers • Curators

    • Art Directors 3. Jobs that Require Social Perception

    • Mental Health Workers • Clergy

    • Nurses

    • Coaches and Scouts{114}

The figure below illustrates these categories, as well as the probability of each of the above examples becoming automated.

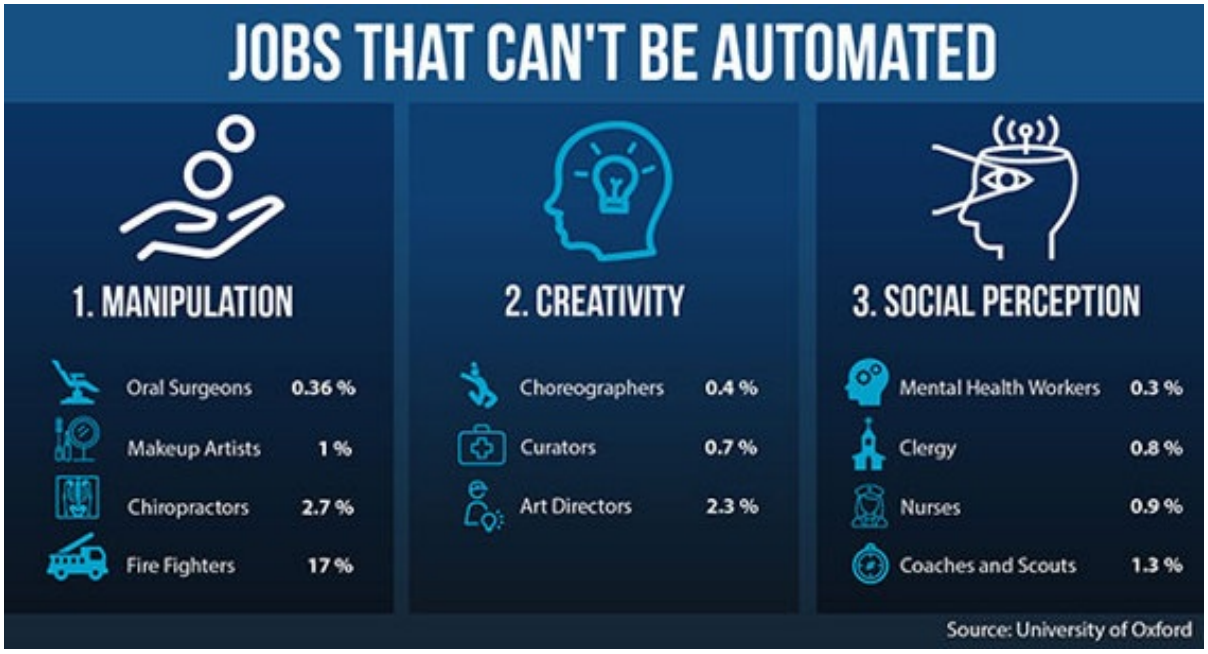

Figure 5.4. Jobs That Can't Be Automated.

In each of the categories, there are also a number of other skills and occupations that are not mentioned here.

This study is just one example of an analysis of the kinds of jobs that would be difficult to replace with robot workers.

From my own observations, I have identified several additional factors that make some jobs harder to automate, which include the following: **1. Jobs that Don't Involve Large Quantities of Data:** None of the jobs listed in the three categories above deal with the analysis or collection of large amounts of data. In contrast, consider the kinds of work performed by someone in the financial sector, in which numbers and trends are a big part of everyday tasks. Obviously, this does not imply that all jobs in a field like finance will be lost to AI technologies; simply that they will be generally easier to replace than those that do not deal with data. Additionally, the implementation of AI tools that collect and analyze data may create new kinds of jobs that do not yet exist.

2. **Jobs Based on Human Interaction:** Each of the jobs listed above involves some degree of interpersonal communication. This will

always be an area in which humans will be superior to AI systems. For this reason, developing strong communication skills will likely raise your value in the job markets for these types of occupations in the future.

3. **Jobs that Have Minimal Repetition or Routine:** Because repetitive tasks are one thing that robotic tools excel at, the jobs that vary greatly from day to day are less likely to be replaced easily by AI technologies.

4. **Jobs that are Difficult to Learn Through Simple Observation:** AI tools rely on monitors and cameras to collect data and to learn. Therefore, jobs requiring a high degree of intuition or flexibility will be harder to replace.

Take a moment to consider these four factors, thinking of several occupations and where they might land on a scale of jobs that are easier or harder to replace with AI tools. The more often you repeat this exercise, the better you'll be able to comprehend the skills and job markets that will continue to thrive in the future.

Also, jobs that require planning or cross-domain thinking are poorly suited for robots and should therefore be more actively promoted by universities and other educational institutions.{115} In addition, jobs that are unpredictable in nature tend to be more difficult for robots to perform.

My suggestion to everyone is to consider the ways in which AI could be used to benefit your workflow. This includes educating yourself about the potential applications for AI and testing out various AI-based solutions. You may also wish to research other emerging technologies and how they could help you at work, like 3D printing, nanotechnology, quantum computing, blockchain, biotechnology, the Internet of Things, virtual reality and augmented reality.

44. Which Industries Will Offer the Best Job Opportunities in the Future?

As the technologies we've discussed continue to grow and expand, being applied in new and innovative ways, there will probably be a multitude of jobs and business opportunities arising that would be difficult to predict in advance.

While these emerging technologies will undoubtedly bring many changes to our workforce, not all of these changes will be negative. AI technologies will also generate many new opportunities for human workers to take on different kinds of tasks and jobs.

According to John Koetsier, a journalist and tech analyst, the 13 fields below will offer new jobs and opportunities for innovation in the future. Each of these fields is also more likely to be staffed primarily by human workers than delegated to automated services. These 13 fields are: • Artificial Intelligence • Augmented or Mixed Reality • Virtual Reality • Drones

- • Robotics and Automation • Genomics
- • Brain-machine Interfaces • Data Science
- • Blockchain
- • Internet of Things • Nanotechnology and Swarm Intelligence • Quantum Computing • 3D Printing{116}

In addition, a study by Forrester Research estimates that approximately 15 million new jobs will be created in the United States alone over the next 10 years as a direct result of AI and automation. This is equivalent to 10 percent of the American workforce today.{117}

One of the industries that will continue to generate numerous opportunities is health care. Not only will technology create new applications and tools to aid in the practice of medicine, but it will also probably create a need for additional types of treatments for symptoms resulting from addictions to technological applications and devices. These symptoms might include a lack of interpersonal skills stemming

from overuse of devices or virtual reality environments, for example, which is why I recommend moderation in any implementation of new technologies.

Due to the requirements of the Paris Climate Accord, many countries will soon need to take measurable actions toward implementing renewable energy technologies. This will create significant job opportunities in the manufacturing, construction, and installation of products that serve these needs. One study found that this alone could create up to 10 million new jobs in the fields of wind energy, solar energy, and energy efficiency.{118}

Additionally, any field related to what is known as “soft human skills,” including emotional intelligence, creativity and social skills, will have a higher value in the job market of the future, providing people who have those skills with new and interesting job options.

45. Will Artificial Intelligence Help the Economy Grow?

Experts believe that artificial intelligence, automation and robotics will generate significant gains in productivity and efficiency, enabling products and services to be produced and provided faster than ever before. That in turn will generate fantastic opportunities for the businesses on the leading edge of these technologies.

In his book *Epiphany Z,* futurist Thomas Frey highlights an interesting concept known as the law of exponential capabilities, saying, "*With automation, every exponential decrease in effort creates an equal and opposite exponential increase in capabilities*." Basically, this means that when it takes less time to perform a task, we can perform a greater number of tasks overall.{119}

Many of the world's leading AI experts believe that artificial intelligence will assist and improve the working experience for people around the world. Manoj Saxena, the first general manager for IBM's Watson, puts it this way: "*There are 1.3 billion global workers whose jobs will be dramatically enhanced and improved through AI*."{120}

Personally, I agree with Saxena's views, but I also believe that there is a huge knowledge gap that will need to be addressed in order for people to understand the benefits and applications of AI to their workflows. This is one of the main reasons why I was motivated to write this book.

Considering the many business processes that AI can improve upon, it is easy to imagine how AI will be able to significantly enhance productivity. One study done by Accenture concluded that in some countries, including Finland, Sweden and the United States, labor productivity could increase by 35-37 percent by the year 2035 because of these technologies.{121}

The same study found that artificial intelligence tools have the capability to double the GDP of 12 developed countries by the year 2035. It also concluded that there are three channels by which AI can lead to growth:

- **Intelligent Automation:** Because AI tools are capable of self-learning and can automate even complex physical tasks, they can lead to a greater level of efficiency in production.
- **Labor Capital Automation:** AI can help workers to focus on performing only the tasks they do best.
- **Innovation Diffusion:** AI has the potential to propel innovation forward.{122}

When AI is used to automate repetitive or data-heavy tasks, it creates opportunities for human workers to focus on the tasks that only they can do, leveraging the most potential from both the AI and the human resources.

While AI developments are sometimes portrayed negatively in the media, these kinds of studies can help to highlight the many potential benefits we can experience from their applications.

In order to gain the greatest economic benefits from AI, it will be crucial for us to share knowledge and insights across our society. Building AI research and development centers in every major city could further facilitate the application of AI to various industries, while also benefitting small businesses and entrepreneurs. The more open our society is to sharing information about AI, the more the entire world will benefit from its growth and development.

46. What Will Be Some of the Most Common AI-Related Jobs?

If you're interested in some of the technical aspects of AI, there are a number of fantastic employment opportunities available to you already. The development of AI technologies is a top priority for most of the leading companies right now, and they are on the lookout for talented AI workers.

These are some of the AI-related job titles that are currently in the highest demand on job search portals: data scientists, software engineers, research scientists, machine learning experts, and deep learning experts.

You can learn about these topics through a number of different online courses. Most of these courses, once completed, usually offer either a diploma or certificate that can add accreditation to your resume, or a badge that can be showcased on your LinkedIn profile.

However, there will be an even greater demand for professionals who understand how AI works in general, as well as how to help companies and individuals apply these technologies for the benefit of businesses and society. Below are some of the most interesting examples of these types of jobs, which I believe will be in demand in the future:

- **AI Chatbot Designer:** A professional who knows how to design AI-based chatbots that can attend to basic customer service needs and provide a positive user experience.
- **AI Digital Marketing Expert:** Someone who understands how to leverage various digital marketing and social media tools that employ AI to create more effective marketing strategies.
- **AI Business Strategy Consultant:** An expert who analyzes a company and recommends ways that company can build AI services and products with tools like IBM's Watson, Microsoft Azure, or Amazon Web Services. While it can be helpful to develop

internal AI tools, it is also possible to purchase existing solutions from well-known providers like the ones listed above.

- **AI Strategy Consultant for the Public Sector:** An expert who can identify potential challenges that will arise due to the introduction of AI into society and can solve problems through AI training. This is an important role for helping society to become familiar and comfortable with the use of new AI technologies. This type of professional could also serve those who have lost their jobs to AI and automation by matching individuals with suitable retraining programs to help them obtain new types of employment.

- **Tech-Addiction Counselor or Coach:** A skilled counselor or coach who understands, and knows how to treat, the emotional and physical impacts of the rapid growth of AI and the problems that may arise from overuse. With the increasing presence of AI technologies in our everyday lives comes the potential for users to become addicted to some of these products. Also, some people may suffer from negative emotional consequences due to an overreliance on AI at the expense of normal social interactions and relationships with humans.

- **Creativity Coach:** A trained professional with experience in helping others to develop human-based skills including social and emotional intelligence, and creativity. This is an important role that, because it cannot be filled by robots, will hold a great deal of value for people in the future.

The list above includes just a few of the jobs that I believe will be in high demand as AI continues to grow and develop. There will also be plenty of new careers that we can't even imagine yet, which will arise from the new challenges and opportunities created by AI technologies.

In addition to those listed above, there are also several interesting jobs related to AI that are already being posted on job search websites. The list below was gathered from the Glassdoor website, and each requires a combination of AI-related skills and additional skillsets:

- **AI Journalists:** Reporters who are able to write articles about AI for mainstream news outlets.
- **AI Attorneys:** Legal professionals who handle intellectual property and technical cases related to AI.
- **AI Technical Sales Directors:** Salespeople who are able to understand and market AI-based products to consumers.
- **AI User Interface Designers:** Developers who can apply AI to customer interfaces to improve their experiences.
- **AI Marketing Managers:** Professionals who build awareness for companies that provide AI products and services.[{123}]

Because artificial intelligence will have an impact on so many business models, we will likely see a whole range of similar job descriptions for familiar roles that will incorporate AI components, creating a variety of new career opportunities.

As previously mentioned, perhaps the most important skill in the future will be the ability to understand the complex ways in which AI will change business and society. Such an understanding will be valuable in so many ways to help companies and individuals transition into this new way of life.

Starting a Company in the Era of AI

People often dream about starting their own business, perhaps envisioning it as a way to be their own boss, feel more professionally fulfilled, or achieve financial success. However, starting a business can also mean facing challenges that many average people are not ready to handle. Tough questions arise, like: Where will I find clients? How will I pay my expenses? What if I fail?

One of the main challenges that entrepreneurs encounter is a lack of education on what it takes to succeed in business. I believe this is something that should be taught from an early age, as well as how to recognize and utilize personal strengths and weaknesses.

As mentioned earlier in the chapter, according to a recent McKinsey report, between 400 and 800 million people may need to switch occupations by the year 2030, which will clearly create some big challenges in our society.{124}

Some of these people might want to simply find a new place of employment, but for many, a more helpful approach may be to start their own business.

Past methods of hiring the staff needed to start a new business can often be cost prohibitive in today's world. Traditionally, most new businesses would hire full-time employees to take on roles in sales, marketing, customer support, graphic design and administration. However, when starting a business from scratch today, it can be difficult to generate the funds necessary to support that kind of infrastructure without the aid of outside investors or government grants.

One potential solution to this would be to apply a new model, leveraging both the power of artificial intelligence tools and outsourced talent, to get a business up and running. In the figure below, you can take a look at the differences between the old patterns of building a company and the new methods available in the era of AI.

The new approach, a combination of using AI services provided by large tech companies and outsourced talent in the form of freelancers, offers significant cost savings and huge gains in productivity and efficiency. Additionally, this method provides a more flexible structure which can be changed or stopped at a moment's notice, as well as location independence.

Figure 5.5. New Company Organizational Chart.

Here are some of the ways that you can leverage AI services and outsourced talent as you start your company:

- **AI Services:** Large tech companies like IBM, Google and Amazon offer cloud-based AI services, which allow you to basically “buy” AI from them. Currently, you can use these types of AI services to help with things like market research, digital marketing automation, and even basic administrative assistance tasks. They can also be used to help you build your own customized chatbots. These are invaluable tools that can help your company handle basic customer service support functions while reducing, or even eliminating, the need for hiring staff.

- **Freelance Talent:** There are many freelancing sites available where you can post job openings in a variety of fields. For example, you can find graphic designers, administrative assistants, and even AI programmers through these platforms who can help you to accomplish more than you could on your own. Hiring help this way

enables you to avoid all of the overhead costs associated with traditional employment, such as office space, benefits, and vacation time.

As more people take advantage of this model, we will likely see an increase in single-person companies that are better prepared to adapt to the changing technological environment of our world.

This is not to say that nobody should hire workers in the traditional manner, but rather to encourage entrepreneurs to consider new models that incorporate AI and freelance talent, as these models are usually more suitable for the current technological climate.

For every small business, it will be critical to examine the kinds of tasks for which AI can be used. In Chapter 8, we'll discuss some of the AI-related services provided by large tech companies, although there are more than we have room to discuss in this book.

47. What Are the Skills to Strive for in the Future Job Markets?

Because the introduction of AI technologies will bring huge changes to the job markets of the future, it is imperative to start developing skills that will add value to your resume now.

With this in mind, I've compiled a list of some of the skills that will be the most valuable in the coming years. While there is no guarantee that these skills will land you a job on their own, they will make you a more attractive candidate to employers, while also adding to the quality of your personal life and relationships.

The excerpt below includes a description of 24 skills that I published previously in a book entitled *The Future of Higher Education - How Emerging Technologies Will Change Education Forever.*[{125}]

People Skills for the Future

1. **Self-awareness and Self-assessment:** In today's rapidly changing and complex world, self-awareness is extremely valuable, helping people to recognize their full potential and areas that might need to be improved. It can also help people to identify and accept their uniqueness, which can add self-esteem and motivation for learning. This skill is particularly valuable for entrepreneurs and freelancers.

2. **Emotional Intelligence:** By one common definition, emotional intelligence is one's capacity to be aware of and express emotions. Historically, showing or talking about emotions was once viewed as a sign of weakness in many cultures, but in recent years, more and more professionals are starting to discover the benefits of emotional intelligence. I personally believe that we are only beginning to discover the power of this skill.

3. **Social Intelligence:** This skill relates to how one is able to interact with others in various situations. It involves a basic understanding of the thoughts and opinions of others.

4. **Interpersonal Intelligence:** The ways that we communicate and socialize with our close family and friends can actually help us to have a more balanced life and a greater sense of well-being and happiness. This in turn allows us to put greater efforts into your work.

5. **Empathy and Active Listening:** Maintaining a deep understanding of the ways that people experience things will help us to move forward in business and in our personal lives.

6. **Cultural Flexibility:** This is the ability to quickly adapt to new cultures and new ways of working and living. This goes beyond cultural understanding, allowing people to be flexible when they encounter different belief systems and cultural values.

7. **Perseverance and Passion:** Many people pursue quick fixes and instant gratification, so teaching patience for long-term gratification is vital. One way to teach this skill is to share inspiring role models and case studies of people who have had success, especially when the examples offered relate in some way to what the students are learning.

8. **A Focus on the Common Good:** Recognizing the value of the common good, rather than simply focusing on individual wants and needs, can help people to work together.

9. **Mindfulness and Meditation:** There are countless studies that show the benefits of these practices, and there are more and more stories of high achievers in various industries (sports, business, finance, and more) finding success through mindfulness and meditation.

10. **Physical Training:** Maintaining physical balance can help you to enjoy clarity, mental focus, and a healthier life in general. As people begin to spend more time in front of the screen, physical motion will become even more vital.

11. **Storytelling:** Storytelling is one of the most natural ways for humans to communicate with each other through common

understanding. Thousands of years ago, storytelling was the primary form of communication and this same form is still very helpful today. Stories are powerful tools to evoke emotion and to understand complex situations.

Business Skills for the Future

12. **Problem Solving:** This skill is more relevant than ever due to the speed of technological innovation and the changing nature of the way people do business. Problem solving skills can help people to understand their co-workers, environments, and even the tools and machines that they interact with.

13. **Creativity:** It is easy to overlook this simple skill, but it will be a critical part of many career markets going forward. As more technology is introduced into business and education, it will become increasingly important for people to use their creativity to develop unique and innovative ways to implement that technology.

14. **Adaptability to New Technology:** Moving forward, the people who are willing and able to adapt to new technologies and the opportunities they provide are going to have the best orientation towards success, while those who resist new technologies are likely to fall behind or miss out. While it is important for universities to teach students how to be proactive with new technologies, they should also put resources into training teachers about creative ways to use technology within the classroom.

15. **Entrepreneurial Mindset:** Within the next 5-10 years, advancements in robotics and machinery will likely change the kinds of jobs available on the job market. People who have strong entrepreneurial skills and know how to seek advice in the right places will be able to experience the benefits of these changes.

16. **Sales and Marketing:** More than ever before, people are creating businesses centered around their passions. For this to work, they need to understand the fundamentals of sales and marketing techniques, including how to communicate what they can offer and how to acquire new customers.

17. **Data Analysis:** According to Clive Humby, "*Data is the oil of the 21st century*." As more things become digitalized, data analysis becomes an increasingly important skill.

18. **Presentation Skills:** One important business skill that is not likely to change in the future is the ability to speak and present to diverse groups of people. Those who can master this skill often find themselves in leadership positions, both on smaller projects and on larger teams.

19. **Environmental Intelligence:** As people begin to consider the value of preserving resources over time, it will be important for them to understand how technology can help make that happen. Finding value in our common resources should be a skill that is taught to students early and often.

20. **Large-scale Thinking:** As the world becomes ever more connected, the ability to think about and analyze large entities becomes vital. While it is important to be able to consider the small details of a project, big-picture thinking that accounts for complexities and interwoven elements will be valuable and should be highly emphasized in the world of education.

21. **Accounting and Money Management:** Not only can basic accounting principles help people in their personal lives, but it can also help them to understand the complexities of starting, running, or participating in a business.

22. **The Ability to Unplug:** As strange as it may seem to include this as a business skill, consider the fact that it is becoming harder to find places that don't have Internet connections nowadays. People who are able to disconnect from their devices and connect in more intimate ways with others will experience greater joy and less stress than those who are addicted to their devices.

23. **Spotting Trends:** In a rapidly changing world, being able to recognize the signals of potential opportunities in the future is immensely helpful. Not only is this skill accessible to people of all backgrounds, but it can also help entrepreneurs to take advantage

of business ventures, simply by learning how to see trends and take action at the right time.

24. **Design Thinking and Design Mindset:** In the future we will have products and services that we cannot even imagine today. Design mindset is a solution-focused approach where you find desired solutions to complex problems. This is a skill that everyone can learn and will be increasingly valuable in the future.

In addition to helping you get or keep a job, the skills listed above are particularly useful if you are interested in developing your own business in the future.

Figure 5.6. below showcases some of the skills covered above, while also adding in some additional skills that will be important in the future. These are separated out into four different sections:

- **Technical Skills Related to AI and Blockchain:** Technical skills that relate to deep learning, machine learning, robotics and data science will be in high demand over the next few years. There will also be an increasing demand for engineers to work in the self-driving car industry and programmers who can do cryptocurrency and blockchain work.

- **Social Intelligence Skills:** We will also see a rise in demand for skills that relate to helping others, including consulting, retraining and coaching. Empathy and emotional intelligence will become more valuable job skills in the future.

- **A Creativity Mindset:** This includes the ability to create something from the ground up, in addition to skills related to design. Having a creative mindset can help with personal branding and professional self-promotion, which are essential for individuals who want to set themselves apart and get noticed in a crowded job market.

- **Learning How to Learn:** This category includes skills like self-awareness and the ability to learn something at a faster pace than others, in addition to “unlearning” bad habits or outdated practices. The Future of Life Institute has identified two particularly interesting

examples of such skills. The first is known as computational sense-making, which refers to the ability to understand machine and human-based work. The second, contextualized intelligence, refers to the ability to derive meaning from surrounding cultures, individuals and business environments, and from society as a whole.[{126}]

Figure 5.6. Future Skills and Competencies.

Which of these skills would you like to improve upon? Select your top three and commit to developing them over the next 12 months.

48. What Is the Best Way to Hire Talent to Work with Artificial Intelligence Technologies?

One of the questions I get asked most frequently in my seminars and workshops is how entrepreneurs and small businesses can start to use artificial intelligence in the projects they are currently working on.

Big tech companies like Google, Facebook, Amazon, Microsoft, IBM, and Baidu are able to employ some of the best AI engineers in the world. However, there are still plenty of opportunities for the rest of us to work with skilled AI professionals as well, by hiring those who offer their services as freelancers.

The practice of hiring freelancers is becoming increasingly more popular and I highly recommend it for small businesses and startups, as it can enable you to quickly access high-quality talent from all over the world in a more flexible manner. In fact, it is estimated that up to 50 percent of the workforce in the U.S. will be comprised of freelancers by 2020.

Before you hire someone as a freelancer, it is important to build a clear description of exactly what you need to be done, as well as what type of person you want to work with.

There are plenty of freelancer websites you can use to find qualified candidates, but by far, my favorite is Upwork, which can be accessed at *www.upwork.com*. Upwork is currently the largest platform for freelancers in the world, and according to its statistics, freelancers on its site offer over 3,500 different kinds of skills and earn more than $1 billion each year.{127}

I have personally used this site over the last eight years and find it extremely useful. You can find freelancers with all kinds of specialties, including data scientists, machine learning experts and deep learning engineers, available to be hired for one-time or ongoing projects.

The ability to work on or with artificial intelligence technologies is actually one of the most highly sought-after skills on Upwork currently. The figure below shows that as of the third quarter of 2017, the Quarterly Skills

Index placed robotics as Upwork's fastest-growing skill, with deep learning at number eight, and natural language processing and machine learning in the top 20. Each of these skills directly relates to artificial intelligence, demonstrating how popular this kind of technology is becoming.{128}

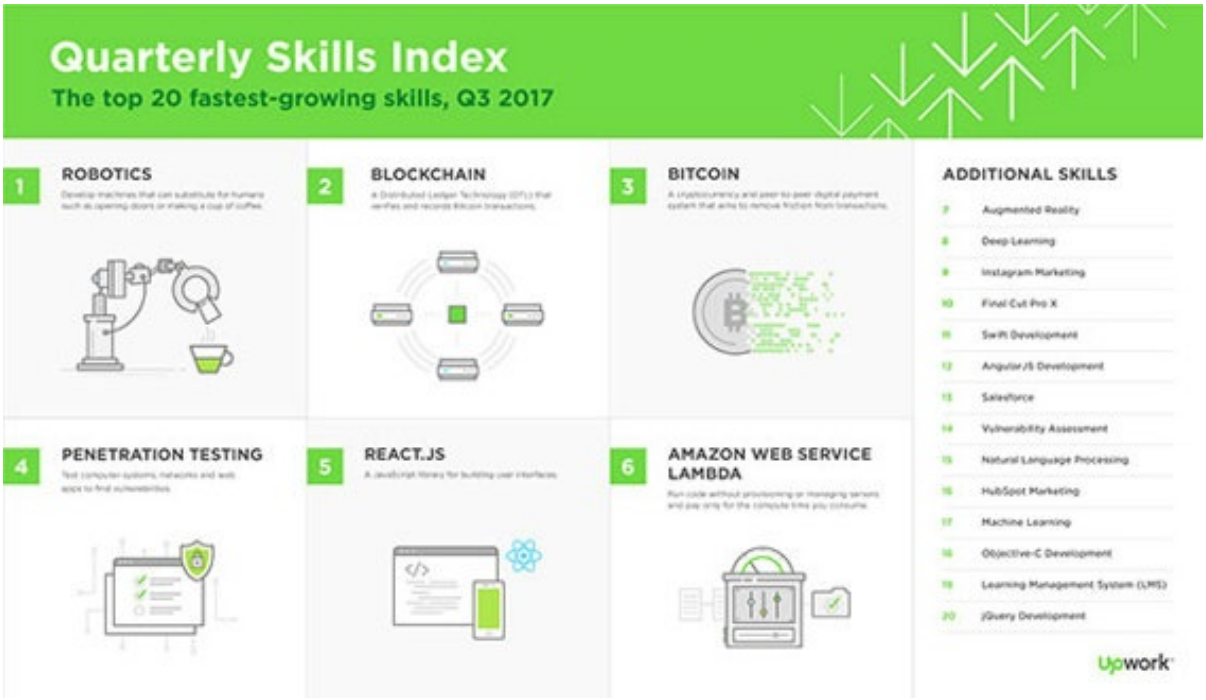

Figure 5.7. 20 Fastest-Growing Skills for Freelancers in Q3 2017 (Upwork)

According to Stephane Kasriel, CEO of Upwork, artificial intelligence is creating incredible opportunities for companies that hire talent through sites like Upwork, stating:

"It's much easier to see when jobs go away than it is to envision the jobs that will be created, but our data clearly shows that businesses are embracing AI and that it's creating enormous opportunity."{129}

To learn more about hiring professionals through Upwork, or to set up a project on the site, I suggest reviewing this article from its help center, found at:

found at:

www.upwork.com/hiring/education/simple-safe-hiring-upwork,

or reading other useful articles on Upwork's blog at:

https://www.upwork.com/blog/

49. Universal Basic Income: Can it Help as Jobs Are Automated?

As experts consider the problem of the many jobs that will inevitably be lost to automation, one possible solution that is often debated is the option of Universal Basic Income (UBI).

Unlike current welfare models that require recipients to prove they are actively seeking employment, this model would provide the same amount of money to all citizens, regardless of employment or financial status, with no strings attached.

When discussing the issue of universal basic income, one problem that often arises is the fact that many of the politicians who offer opinions on the matter don't always have a clear understanding of how drastically the introduction of automation and artificial intelligence will change the job market. For this reason, they have a hard time imagining the number of people who might suddenly find themselves out of work.

Currently, the idea of universal basic income is closely related to work, so it has been generating heated political arguments from all sides. Personally, I believe that some form of government subsidies will probably need to be offered to those who will be left without a job in the coming years. However, it will probably take many attempts and refinements to build a model that truly works for everyone.

UBI is already being tested in countries such as Finland, Canada and Kenya as a way to help individuals and societies adjust to the new digital economy where automation has been taking over and human employment has been dwindling.

In Finland, the program provides over 560 euros (approximately 661 USD) per month to participants. This basic income allows individuals to take part-time employment or even pursue their own business ideas by giving them a base amount with which to buy necessities. Also, this amount is distributed regardless of whether the recipients work or not.

As of the time of this writing, the program in Finland has been running for several months with about 2,000 participants between the ages of 25 and 58. Some of those receiving the income have reported that they feel less stress and are more inclined to look for work or to try out their own business ideas. {130}

One recipient, Juha Järvinen, told *The Economist* that the program has allowed him to take more part-time work, which previously would have cost his family their welfare payments.{131}

Finland's pilot program is the first of its kind in Europe. It was introduced as a way to handle Finland's unemployment problem, which stands at around 10 percent.

A similar program has been announced in Ontario, Canada. This test program was introduced by the province's leader, Premier Kathleen Wynne, in an effort to address the challenges of the modern economy. The program will give thousands of dollars a year to 4,000 residents between the ages of 18 and 64, whether they are married, single, employed or unemployed.{132}

Other UBI programs include one operated by GiveDirectly, a nonprofit organization that allows donors to send money directly to those who need it in Kenya. In addition, a group called Y Combinator in Oakland, California started a test research project at the beginning of 2017, donating up to $2,000 a month to 100 families. This test is expected to run for between six months and a year.

Benefits of Universal Basic Income

Although the pilot programs are quite new, some early research has revealed that those who received basic income have had a decrease in healthcare costs, were less likely to purchase alcohol or tobacco, and worked more.{133} There were also fewer incidents of domestic violence and improvements in childcare, as well as other positive changes.

According to some experts, these types of programs could actually end up saving governments money, arguing that the exorbitant amounts previously spent on community programs for the homeless would be

more wisely spent investing in a universal basic income to be given directly to each individual citizen, regardless of their circumstance.{134}

The theory behind this idea was supported by an experiment conducted in London in 2009. 13 homeless individuals were each given a lump sum of £3,000 (about 4,500 USD) to spend as they wished with no strings attached. A year later, 11 out of the 13 people were no longer homeless. Some experts claim this validates the argument that, given the opportunity, most individuals will use money that is given to them outright to better their situations.

Advocates of UBI claim that the technology boom has been displacing many workers and a basic income distribution would help individuals and society adjust to the new economy.

At the World Government Summit in Dubai, Elon Musk of Tesla explained that artificial intelligence, automation and job displacement will mean that many people around the world will need a basic income from their governments in order to survive.{135}

In fact, there are numerous big name supporters of UBI in Silicon Valley's tech industry, including Facebook's Mark Zuckerberg. The founder of eBay, Pierre Omidyar, has announced that his Omidyar Network will be donating about $500,000 to GiveDirectly, to provide a basic income for 6,000 people in Kenya over the next 12 years.{136}

One researcher in Finland, Roope Mokka, claims that many of those in the tech industry have been outspoken supporters of UBI because they are protecting their own businesses. Mokka argues that there is a fear among Silicon Valley's tech giants that in the future, AI advances will lead to greater wealth that will only be in the hands of investors and entrepreneurs. That in turn will mean a shortage of average customers who can afford to buy their products. However, a UBI would prevent that problem by putting money in the hands of all consumers.{137}

To learn more about universal basic income, you can review articles at www.basicincome.org/, a website that provides insight into the most interesting news related to the topic.

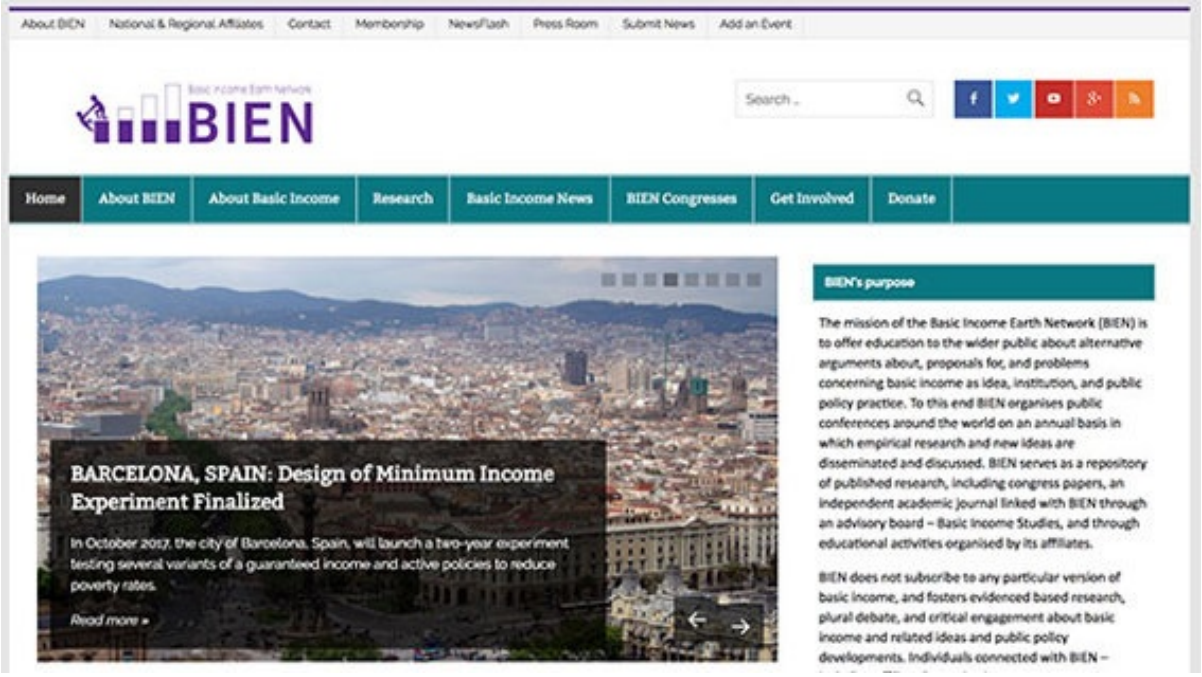

Figure 5.8. Basic Income Earth Network website at [www.basicincome.org.](http://www.basicincome.org)

50. Universal Basic Income: What Are the Challenges?

With the rise of AI and automation technologies in the workforce, and all the human workers who will be displaced as a result, the idea of a universal basic income has been a real hot topic. This issue has divided the opinions of experts around the world, and many concerns about implementing this practice have been voiced, including the biggest challenge, which is how governments would be able to afford it.

Economists estimate that for a country the size of the United States, in order to pay every citizen a basic sum of $10,000 per year, taxes would need to be raised by nearly 10 percent.{138}

Additionally, if 20 percent of the human workforce lost their jobs through automation, governments would also lose the equivalent in taxable income from those workers. However, AI technologies could also help the governments themselves to run more efficiently, saving them money in administrative costs.

A final concern is that the workforce could be further harmed by offering a universal basic income, as it may provide less incentive for people to enter the workforce or to accept less desirable jobs.

In 2016, voters in Switzerland rejected the proposal of a universal basic income, with fewer than 25 percent of the voters supporting it. A key concern in this country was its open borders, and a fear that foreigners may flood the country seeking free money, according to the BBC.{139}

Another potential option for governments seeking to ease the challenges presented by the changes in the job market is known as **negative tax income**. This would basically mean that a government would establish a certain acceptable income level and offer only those who earn less than this amount what they would need to meet the base income criterion.

Negative tax income models overcome some of the challenges posed by universal basic income, as only citizens earning less than a certain amount would qualify to receive aid, creating less of a financial burden on governments.

governments.

Both universal basic income and negative tax income models have benefits and drawbacks that must be considered. Each represents a shift in the ways that countries' governments would operate amid the new technologies.

Mokka argues that societies themselves will need to change in more ways than one, stating, "*Somehow, we need to be able to convene both the automation of demeaning tasks and take into consideration the desire to work that right now energizes politics like no other idea.*"{140}

He also points out that work has a purpose for the state and for individuals that will need to be redefined as technologies change the way we operate, saying that "*Metaphorically speaking, basic income is not an app to save the industrial society, but it could be the start of a new operating system for the post-industrial society*."{141}

Advocates of universal basic income believe that it will help individuals adjust to the realities of changes that arise in a new economy. They also claim that it will open doors for people to become entrepreneurs, therefore boosting the economy even further.

However, there are still many opponents of these practices, who are concerned about the financial viability of UBI and its potential to harm the economy by negatively impacting the willingness of individuals to work.

Because those on both sides of the issue hold strong views, as well as the fact that any existing programs are still in testing, it may be many years before we see a UBI program fully in place.